

SIXTH BIENNIAL REPORT
IOWA STATE
AGRICULTURAL COLLEGE
AND FARM.
1874--1875.

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SIXTH BIENNIAL REPORT

OF THE

BOARD OF TRUSTEES

OF THE

IOWA STATE

AGRICULTURAL COLLEGE.

AND FARM,

MADE TO

THE GOVERNOR OF IOWA,

FOR THE YEARS 1874 AND 1875.

DES MOINES:
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1875.

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STATE AGRICULTURAL COLLEGE, }
AMES, IOWA, December 15, 1875. }

TO HIS EXCELLENCY, CYRUS C. CARPENTER, GOVERNOR:

In accordance with the statute defining the duties of the Board of Trustees of the Iowa State Agricultural College and Farm, I have the honor to submit, herewith, the Sixth Biennial Report of said Board.

By order of the Board of Trustees.

A. S. WELCH, *President.*

E. W. STANTON, *Secretary.*

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A. TRACY.....	SPILLVILLE.
C. C. WARDEN.....	OTTUMWA.
HON. LAUREL SUMMERS.....	LE CLAIRE.

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* During 1874.

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†MRS. A. THOMPSON,
Housekeeper.

* In 1874.

† In 1875.

REPORT OF THE TRUSTEES.

To the General Assembly of the State of Iowa:

The Board of Trustees of the Iowa State Agricultural College respectfully report, that when they entered upon the discharge of their duties, in May, 1874, they were almost wholly unacquainted with the condition of the College, its work and its wants. Since then, they have given to the discharge of their duties as much time as they could, under the spirit of the law of their appointment, and they now, respectfully, make the following recommendations:

First. They concur fully in the recommendations of President Welch, made in his report to the Board of Trustees, for the removal of the present heating apparatus and the substitution therefor of a system of heating by steam, and for the repairs, indicated by him, as necessary for the main college building; and they fully endorse the statements and arguments made by him in support of these recommendations.

Second. They fully endorse the President's suggestions and recommendations upon the subject of manual labor in the College.

Third. They also concur in, and endorse, both, the President's recommendation as to an appropriation for additional buildings for the accommodation of students, and also as to the kind of buildings to be erected with such appropriation, should it be made. Unless such appropriation be made, it will be impossible for the College to grow beyond its present capacity.

Fourth. We earnestly recommend the appropriation by the General Assembly of a reasonable sum, yearly, for keeping the buildings at the College in repair. These buildings have cost the State a large amount of money. Like all buildings, public and private, they are liable to accident and decay; and small sums, properly expended for repairs, often prevent large losses, which must surely occur if such repairs be delayed.

The Trustees have no fund out of which the cost of these repairs can be paid without doing great injustice to other interests of the College.

The fund derived from the interest on the leased lands cannot be touched for this purpose. The earnings of the farm should be devoted to its improvement. Some years ago the Board of Trustees invested some of the interest received, and not then needed for the support of the College, in lands known on the college books as "Sioux City lands." These lands are under lease, and the interest derived from the leases has, for several years, been used as a contingent fund for repairs, etc.; and such use of this money has been regularly reported to the General Assembly and not condemned. But it seems to us that such use is improper, although we have been compelled by imperative necessity to adopt it. It is clear that the money thus invested could not have been so used, and it is difficult to understand why, if the principal could not be so used, the interest from it can be. The Trustees are exceedingly desirous of being relieved from an apparent misappropriation of any fund entrusted to them, and nothing but the long continued acquiescence of the General Assembly in the use of this fund in this way, and the absolute necessity of continuing so to use it, in order to prevent serious loss to the State, could have induced the present Board to continue the former practice.

Fifth. There is now in the hands of the Treasurer of State, of the permanent endowment fund, the sum of \$52,554.37. Of this amount, the sum of \$12,200, has been invested by the State Treasurer in Iowa State bonds bearing seven per cent. interest, payable semi-annually. The balance, \$40,354.37, is in his hands, not invested, and, of course, not productive. The law of Congress, donating the endowment lands to the College, requires the investment of this fund in stocks of the United States, or of the States, or some other safe stocks yielding not less than five per centum on the par value of said stocks.

The law of the State requires its investment "in the registered bonds of the United States, or in the bonds of this State." The Treasurer of State so construes these laws as to render any further investment of these funds impossible, without additional legislation. According to his construction of the law, he must get for any amount of the funds invested by him, an equal amount of bonds, at their par value, and as the bonds of the United States, and of this State, are all above par, it is impossible to invest the money now on hand, unless provision be made for the payment of the premium from some other fund, and the College has no fund which it can devote to this purpose. If the General Assembly has constitutional power so to do, we earnestly recommend the passage of a law covering the amount of this

fund now on hand into the State Treasury, and the placing in the hands of said Treasurer, of a bond of the State of an equal amount, bearing such interest as may be deemed just—the interest to be applied to the purposes designated in the law of Congress. If this can be done, the principal sum thus absorbed by the State could be used to put up the additional buildings needed at the College, thereby increasing to that amount the value of the property owned by the State. If this cannot be done, we recommend such an amendment of the State law as will allow the investment of this fund in county or city bonds, issued under the laws of this State; or that the General Assembly memorialize Congress to so change the law as to permit the investment of the fund in bonds and mortgages on farming lands in this State. By either of the latter modes of investment, interest at from eight to ten per cent. can be realized on the fund, to the great benefit of the College. If the present laws be continued, the result must be, that in a few years the revenue of the College will be so reduced as to seriously cripple its usefulness, or compel it to rely upon appropriations by the General Assembly to enable it to continue its work.

Sixth. The Board of Trustees had some difficulty in construing the second section of chapter 71, Acts of the Fifteenth General Assembly, but upon careful consideration of the section in connection with the first section of the same act, concluded that the proviso to the second section applied only to the renewal of leases to the same lessee, and not to the granting of leases on unleased or forfeited lands to a new lessee. Acting upon this construction of the law, the Board has authorized Mr. Bassett—whose contract with the Board, as its agent, to lease the College lands and collect the interest therefrom, will expire December 31st, 1875—to continue, until the further order of the Board, to lease unleased or forfeited lands of the College, and to continue to collect for the College such amounts of principal and interest as may become due the College, and to transmit the same to the College Treasurer. The Board has required Mr. Bassett to give a new bond in the sum of ten thousand dollars for the faithful performance of his duties.

The Board consider the continuance of the agency at Fort Dodge a matter of importance and convenience both to the College and the lessees, and are of the opinion that it should be in the future, as it has been in the past, self sustaining.

The Board take great pleasure in commending the College to the fostering care of the General Assembly. Two years ago the institution was, to some extent, under a cloud arising from the investigation

had at the last session of the General Assembly, and when the present members of the Board entered upon the discharge of their duties, some of their number had serious doubts as to the usefulness and success of the institution. We are gratified to say that these doubts have been removed by our experience as Trustees of the College. It certainly is not what we desire and hope it will be, but we express the decided opinion that the College has grown, in the extent and value of its work, in full proportion to the means placed at its disposal, and that the work it is now doing is of high importance and of great value to the State.

The Board respectfully refer to the accompanying reports of the President and Faculty for full information of the various subjects therein mentioned.

S. J. KIRKWOOD
L. SUMMERS,
A. TRACY,
C. C. WARDEN,
C. E. WHITING.

PRESIDENT'S REPORT.

REPORT OF THE PRESIDENT TO THE BOARD OF TRUSTEES.

GENTLEMEN:—I herewith transmit to you my annual report. It presents, concisely as may be, the operations of the entire "College and Farm," and is accompanied by the statements made by the heads of the various departments.

The Iowa Agricultural College has completed its seventh year. From its opening to the present it has striven to fulfill more and more readily the spirit of the congressional law, as interpreted by the wisest men in the land. Declining to follow the lead of extremists, who demand the study of classics on the one hand, or mere manual practice on the other, it has aimed to realize the real object for which the national industrial schools are founded, namely: to furnish to the industrial classes the means of an education in the several pursuits and professions of life, which should be at once liberal and practical. While seeking to impart broad and accurate scholarship in the sciences that underlie special industrial pursuits, it has not ignored the fact that, the work of the specialist is not more important, either to himself or to the world, than the duties of the parent, the citizen, or the man.

Indeed, it is held by the most liberal friends of technical education, that a large success in any industrial pursuit, rests on intellectual power; that the Agricultural College ought to confer on its pupils something broader and better than mere manual dexterity, and that the skill of a master, in any calling, can be gained only by uniting science and practice.

With this general indication of the scope and spirit of this enterprise, we will add that its system, courses of study, and mode of operation may be learned minutely from the following pages.

COUNTY REPRESENTATION.

Sixty-nine counties were represented during the two years.

STUDENTS IN THE BUILDING.

COUNTIES.	1874	1875	COUNTIES.	1874	1875
Allamakee.....	1	4	Johnson.....	4	2
Appanoose.....	2	....	Jones.....	10	10
Audubon.....	....	1	Keokuk.....	5	3
Benton.....	14	12	Lee.....	1	1
Blackhawk.....	5	3	Linn.....	2	3
Boone.....	10	11	Louisa.....	4	3
Buchanan.....	9	10	Lucas.....	....	1
Butler.....	2	2	Marion.....	2	2
Carroll.....	5	6	Marshall.....	10	5
Cass.....	2	1	Mitchell.....	3	....
Cedar.....	11	9	Monona.....	1	1
Cerro Gordo.....	4	2	Muscatine.....	4	3
Chickasaw.....	6	4	Page.....	2	2
Clayton.....	3	....	Plymouth.....	2	2
Clay.....	....	1	Pocahontas.....	1	1
Clinton.....	13	10	Polk.....	12	19
Crawford.....	....	1	Pottawattamie.....	2	2
Dallas.....	4	5	Poweshiek.....	1	1
Decatur.....	2	2	Sac.....	....	2
Delaware.....	6	3	Scott.....	5	10
Des Moines.....	1	1	Sioux.....	1	1
Dubuque.....	2	....	Story.....	17	24
Fayette.....	4	2	Tama.....	5	3
Floyd.....	1	1	Taylor.....	1	3
Greene.....	1	....	Union.....	1	1
Guthrie.....	2	3	Van Buren.....	1	1
Hamilton.....	6	1	Wapello.....	5	1
Hancock.....	2	1	Warren.....	1	2
Harrison.....	4	8	Washington.....	8	5
Hardin.....	3	7	Wayne.....	2	1
Henry.....	4	4	Webster.....	4	2
Howard.....	6	4	Winnebago.....	....	1
Humboldt.....	....	1	Winneshiek.....	6	2
Jackson.....	1	...	Woodbury.....	....	1
Jasper.....	....	1			

STUDENTS OUT OF BUILDING.

COUNTIES.	1874	1875	COUNTIES.	1874	1875
Benton.....	....	1	Jones.....	1	....
Boone.....	1	....	Marshall.....	1	....
Clinton.....	1	....	Polk.....	3	....
Crawford.....	1	....	Taylor.....	1	....
Greene.....	1	....	Story.....	27	32

COUNTIES NOT REPRESENTED.

Adair,	Franklin,	Mills,
Adams,	Fremont,	Monroe,
Bremer,	Grundy,	Montgomery,
Buena Vista,	Ida,	O'Brien,
Calhoun,	Iowa,	Osceola,
Cherokee,	Jefferson,	Palo Alto,
Clarke,	Kossuth,	Ringgold,
Davis,	Lyon,	Shelby,
Dickinson,	Madison,	Worth,
Emmet,	Mahaska,	Wright.

STUDENTS.

CATALOGUE FOR 1874.—SENIOR CLASS.

NAME.	POST-OFFICE.	COUNTY.
Bebout, Estelle J.....	Eddyville	Wapello.
Boardman, Charles D.....	Lyons.	Clinton.
Chase, Charles S.....	Osage.....	Mitchell.
Clingan, Charles E.....	Vinton.....	Benton.
Clingan, Eugene R.....	Vinton.....	Benton.
Hastings, Charles P.....	Muscatine.....	Muscatine.
Kiesel, J. George W.....	Guttenburg	Clayton.
Litteer, Monroe C....	Bedford	Taylor.
Marsh, G. Earl.....	Jesup.....	Buchanan.
McCray, Orlando P	Trenton.....	Henry.
Palmer, Mary A.....	Ogden	Boone.
Parsons, Alfred A	Fayette.....	Fayette.
Paull, Eva E	Sigourney.....	Keokuk.
Pyne, Edward A.....	Vinton.....	Benton.
Smith, Ida E.....	Charles City.....	Floyd.
Smith, William R.	Davenport.....	Scott.
Tupper, Kate N.....	Des Moines.....	Polk.
Whitaker, Joseph R.....	Hook's Point.....	Hamilton.
Yates, Samuel Y.....	Stanwood.....	Cedar.—19.

JUNIOR CLASS.

Allen, Clara A.....	Clear Lake.....	Cerro Gordo.
Cadwell, E P	Independence.....	Buchanan.
Chamberlin, Albert P.....	Cambridge.....	Story.
Cherrie, Millah M.....	Knoxville.....	Marion.
Cunningham, Alice.....	Knoxville.....	Marion.
Curtis, Lizzie M	Independence.....	Buchanan.
Haycock, Junnie B.....	Richland.....	Keokuk.
Kelley, R. P.....	Butler	Keokuk.

NAME.	POST-OFFICE.	COUNTY.
Lee, Charles H.....	Mapleton.....	Monona.
Lyman, Hannah P	Boonsboro.....	Boone.
Macomber, Frank J.....	Lewis.....	Cass.
McCormick, Flora B.....	Manchester.....	Delaware.
Neal, Celestia A.....	Davenport	Scott.
Palmer, Thomas L.....	Washington.....	Washington.
Patrick, Herbert R.....	Independence	Buchanan.
Peterson, Charles E.....	Panora.....	Guthrie.
Ross, Ida M.....	Nevada.....	Story.
Rudolph, Martin E.....	Manchester.....	Delaware.
Sherman, Bertie H.....	Cresco.....	Howard.
Sherman, Ida L.....	Fredericksburg....	Chickasaw.
Smutz, Eli J.....	Polk City.....	Polk.
Thornton, Lucius C.....	Cedarville	Pocahontas.
Wattles, Mason J	Glidden	Carroll.
Whitaker, Catharine R.....	Hook's Point.....	Hamilton.
Whitaker, James M.....	Hook's Point.....	Hamilton.
Wills, Nancy.....	Boone.....	Boone.
Wilson, Lizzie M.....	Crystal.....	Tama.
Wilson, Maggie D.....	Crystal.....	Tama.—28.

SOPHOMORE CLASS.

Aitken, Martin I.....	Mason City.....	Cerro Gordo.
Anders, A. J.....	Winthrop.....	Buchanan.
Ankeny, Maud H.....	Clinton.....	Clinton.
Barker, Arthur P.....	Camanche.....	Clinton.
Beard, Lewis W.....	Frankville....	Winneshiek.
Blodget, Albert M.....	Le Mars.....	Plymouth.
Blodget, Julia C.....	Le Mars.....	Plymouth.
Bouck, Ira W.....	Independence..	Buchanan.
Buell, Langworthy J.....	Lyons.....	Clinton.
Branson, Willard S.....	Lamoille.....	Marshall.
Canavan, B. E.....	Ackley.....	Butler.
Child, M. Ella.....	Jefferson.....	Greene.
Claussen, Lorents A.....	Afton.....	Union.
Cobbey, J. Ell.....	Vinton.....	Benton.
Collins, W. S.....	Solon.....	Johnson.
Coykendall, Emma M.....	Rock Falls.....	Cerro Gordo.

NAME.	POST-OFFICE.	COUNTY.
Crow, B. F.....	Woodbine....	Harrison.
Cull, George.....	Lamoille.....	Marshall.
Dndley, Winnifred.....	Ames.....	Story.
Fegtley, John J.....	Utica.....	Van Buren.
Ferguson, George.....	Des Moines.....	Polk.
Fish, Henrietta A.....	Eddyville.....	Wapello.
Frisbie, Carrie.....	Williamstown.....	Chickasaw.
Garard, George A.....	Washington.....	Washington.
Gardner, N. Bruce.....	Washington.....	Washington.
George, Frank W.....	Williamstown.....	Chickasaw.
Gilmore, William T.....	Tipton.....	Cedar.
Goodspeed, Weston A.....	Lexington.....	Washington.
Gue, Horace G.....	Des Moines.....	Polk.
Hardin, James F.....	Steamboat Rock...	Hardin.
Harlow, Ellen W.....	Ames.....	Story.
Hainer, Eugene.....	New Buda.....	Decatur.
Haviland, Charles....	Ft. Dodge.....	Webster.
Haviland, Ida.....	Ft. Dodge.....	Webster.
Hitchcock, Abner E.....	Anamosa..	Jones.
Horning, H. K.....	Des Moines.....	Polk.
Hubner, G. C.....	Ames.....	Story.
James, William M.....	Ames.....	Story.
Kellogg, Howard M.....	Corydon.....	Wayne.
Kellogg, Martha A.....	Nevada.....	Story.
Lawton, M. Louise.....	Lyons.....	Clinton.
Lonsdale, John D.....	Dale City.....	Guthrie.
Maynard, C. M.....	Council Bluffs....	Pottawattamie.
Mead, Ellie E.....	Cresco.....	Howard.
McElyea, C. W....	Ames.....	Story.
McFadden, George B.....	Ames.....	Story.
McGinnitie, Nannie M.....	Eddyville.....	Wapello.
McIntire, Charles C.....	Wilton Junction...	Muscatine.
Merrill, James A.....	Oxford...	Tama.
Mitchell, Flora.....	Ames.....	Story.
Moyer, Flora.....	Jesup.....	Black Hawk.
Nelson, Lillian.....	Clarksville.....	Butler.
Northrup, J. O.....	Strawberry Point ..	Fayette.
Peck, Flora.....	Concord.....	Hancock.
Rudolph Jennie H.....	Manchester.....	Delaware.

NAME.	POST-OFFICE.	COUNTY.
Sears, W. G.....	Marshalltown.....	Tama.
Scott, Henry N.....	Wheatland.....	Clinton.
Shaw, Arvin B.....	Tipton.....	Cedar.
Sheldon, Dwight D.....	Iowa Center.....	Story.
Snell, Joseph J.....	Ogden.....	Boone.
Spencer, Louis E.....	Grinnell.....	Poweshiek.
Stickney, John S.....	Vinton.....	Benton.
Thompson, O. C.....	Boone.....	Boone.
Twinting, Theodore F.....	Mt. Pleasant.....	Henry.
Whitaker, Sarah A.....	Hook's Point.....	Hamilton.
Whiting, Frank.....	Mt. Pleasant.....	Henry.
Windell, J. S.....	Castalia.....	Winneshiek.
Woodward, Walter M.....	Marshall.....	Marshall.
Yard, Louisa.....	Washington.....	Washington.

—69.

FRESHMAN CLASS.

Adams, J. A.....	Frankville.....	Winneshiek.
Albee, Frederick A.....	Atlantic.....	Cass.
Allen, Augusta L.....	Center Dale.....	Cedar.
Allen, Nettie A.....	Clear Lake.....	Cerro Gordo.
Anderson, Frank.....	Eddyville.....	Wapello.
Anthony, Frederick H.....	Camanche.....	Clinton.
Baker, H. R.....	Ames.....	Story.
Baker, William L.....	Des Moines.....	Polk.
Barnard, Albert L.....	Council Bluffs.....	Pottawattamie.
Baughman, Laura J.....	Ontario.....	Story.
Beach, Emma M.....	Tipton.....	Cedar.
Beach, H. B.....	Iowa City.....	Johnson.
Beach, Josephine.....	Tipton.....	Cedar.
Beach, Minnie R.....	State Center.....	Marshall.
Beadle, Emma G.....	Cresco.....	Howard.
Beadle, Lottie C.....	Cresco.....	Howard.
Beard, Angie M.....	Frankville.....	Winneshiek.
Beebe, D. R.....	Polk City.....	Polk.
Beebe, Reba.....	Polk City.....	Polk.
Birdsall, Charles H.....	Williamstown.....	Chickasaw.
Bonbright, C. H.....	Des Moines.....	Polk.
Bond, L. D.....	Sigourney.....	Keokuk.

NAME.	POST-OFFICE.	COUNTY.
Bone, Mary E.....	Homer.....	Hamilton.
Booth, H. E.....	Chamber City.	Louisa.
Bowen, Julia A.....	Sand Spring.....	Delaware.
Brainard, Justin.....	Boone.....	Boone.
Branen, F. M.....	Keokuk.....	Lee.
Branson, M. L.....	La Moille.....	Marshall.
Brotherton, Kitty.....	Ames.....	Story.
Brown, Charles S.....	Fayette	Fayette.
Brown, S. M.....	Clarinda.....	Page.
Brown, William L.....	Des Moines.....	Polk.
Brush, J. B.....	Fisher Creek.....	Marshall.
Buchanan, Butler	Mt. Pleasant.....	Henry.
Cahill, Mary E.....	Ft. Dodge.....	Webster.
Campbell, Alfaretta.....	Washington.....	Washington.
Carter, Sydney B.....	Cresco....	Howard.
Clark, Fannie A.....	Monticello.....	Jones.
Colelo, Craton C.....	Carroll.....	Carroll.
Corbin, J. Frank.....	Tiffin	Johnson.
Cox, J. L.....	Missouri Valley....	Harrison.
Crew, Mary A.....	Lyons	Clinton.
Crosby, James,	Garnavillo.....	Clayton.
Crow, Ella L.....	Woodbine.....	Harrison.
Curtis, Kate L.	Independence.....	Buchanan.
Davis, Eugene F.....	Lyons.....	Clinton.
Dickson, David.....	Glidden.....	Carroll.
Dodd, West.....	Crystal.....	Tama.
Douglass, Geo. B.....	Cedar Rapids.....	Linn.
Doxsee, Jacob W.....	Bowen's Prairie....	Jones.
Eastwood, George P.....	Ames.....	Story.
Eastwood, Mary J.....	Ames	Story.
Eaton, Walter A.....	Boone.....	Boone.
Edwards, Clayton N.....	Springdale	Cedar.
Fensler, William H.....	Missouri Valley....	Harrison.
Ferguson, O. C.....	Shenandoah	Page.
Fox, Butler G.....	Garnavillo.....	Clayton.
Freed, Alice G.....	Ontario.....	Story.
Garard, Mary	Washington.....	Washington.
Geddes, Irwin.....	Des Moines.....	Polk.
Geddes, Patricia.....	Ames.....	Story.

NAME.	POST-OFFICE.	COUNTY.
Grattan, Mary.....	Waukon.....	Allamakee.
Greene, M. H.....	Bangor.....	Marshall.
Hainer, Julius C.....	New Buda.....	Decatur.
Hargrave, Almar P.....	Atalissa.....	Muscatine.
Hawk, Z. T.....	Denison.....	Crawford.
Heald, Anna M.....	West Branch.....	Cedar.
Hellsell, Wm. A.....	Clarence.....	Cedar.
Henry, J. W.....	Centreville.....	Appanoose.
Herrick, Harriet E.....	Monticello.....	Jones.
Himmelreich, Charity C.....	Columbus City.....	Louisa.
Himmelreich, T. T.....	Columbus City.....	Louisa.
Hungerford, John B.....	Burlington.....	Des Moines.
Hunt, Wilber N.....	Ames.....	Story.
Johnson, Barnett.....	La Moille.....	Marshall.
Johnston, Wm. M.....	Allerton.....	Wayne.
Jordan, Richard F.....	Ontario.....	Boone.
Keith, Cora B.....	Vinton.....	Benton.
Kellogg, Rosa.....	Ames.....	Story.
King, Edwin L.....	Vinton.....	Benton.
King, J. R.....	State Center.....	Marshall.
Kuntz, Flora E.....	Polk City.....	Polk.
Langworthy, Ida M.....	Monticello.....	Jones.
Lawrence, A. W.....	Sabula.....	Jackson.
Leas, William A.....	Des Moines.....	Polk.
Lee, Thomas F.....	Oelwein.....	Fayette.
Lewis, Harry P.....	Orange City.....	Sioux.
Lightenhouse, C. C.....	Clinton.....	Clinton.
Locke, Kate N.....	Vinton.....	Benton.
Maben, John C.....	Concord.....	Hancock.
McElyea, Jennie E.....	Ames.....	Story.
McIntire, Frank.....	Ottumwa.....	Wapello.
McKinnon, David.....	Florence.....	Benton.
McQueen, William E.....	Anamosa.....	Jones.
Meredith, Joseph C.....	Holt.....	Taylor.
Merrill, Dell E.....	Frankville.....	Winneshiek.
Merrill, Frederick E.....	Columbus Junction.....	Louisa.
Millnes, J. C.....	West Liberty.....	Cedar.
Moyer, Alexander.....	Jesup.....	Blackhawk.
Moyer, E. T.....	Jesup.....	Blackhawk.

NAME.	POST-OFFICE.	COUNTY.
Neal, Alice.....	Davenport.....	Scott.
Neal, Mary.....	Davenport.....	Scott.
Page, Arthur G.....	Fredericksburg	Chickasaw.
Palmer, H. W.....	Washington.....	Washington.
Palmer, John G.....	Cedar Falls.....	Black Hawk.
Patty, Cora M.....	Redfield	Dallas.
Pierson, William M.....	Springdale.....	Cedar.
Rich, T. R.....	Glidden..	Carroll.
Randall, Frank.....	Cedar Rapids.....	Sioux.
Riley, William.....	Clinton.....	Clinton.
Robinson, Lyman B.....	Belle Plaine.....	Benton.
Roe, George.....	Polk City.....	Polk.
Sanford, Alcimon M ...	Winthrop.....	Buchanan.
Sanford, Wilber Y.....	Winthrop.....	Buchanan.
Scott, J. E.....	Wheatland.....	Clinton.
Shearer, Belle.....	Ames.....	Story.
Sheidler, A. B.....	Xenia.....	Dallas.
Sibley, F. H.....	Anamosa.....	Jones.
Smith, Thomas.....	Ames.....	Story.
Soper, C. M.....	Ontario.....	Boone.
Springer, James T.....	Florence.....	Benton.
Stratton, Fabin.....	Alden.....	Hardin.
Sullivan, M.....	Xenia.....	Dallas.
Svenson, J. T.....	Gowrie.....	Webster.
Todd, L. D.....	Harper.....	Keokuk.
Thomas, W. A.....	Golden Prairie....	Delaware.
Van Buren, H.....	Langford.....	Chickasaw.
Voris, George A.....	Vinton.....	Benton.
Waldron, Lou.....	Nevada.....	Story.
Wardall, Florence C.....	Stacyville.....	Mitchell.
Watters, Walter P.....	Atalissa....	Muscatine.
Welch, William B....	Ames.	Story.
Whitaker, Amelia	Hook's Point	Hamilton.
White, Harley M.....	Vinton.....	Benton.
White, W. A.....	Stacyville.....	Mitchell.
Whited, Alice.....	Alden	Hardin.
Wilbur, C. E.....	Boonsboro	Boone.
Will, James F.....	Iowa Center.....	Story.
Wilson, Ione I.....	Worthington.....	Delaware.

NAME.	POST-OFFICE.	COUNTY.
Wood, Curtis A.....	Iowa Center.....	Story.
Wood, Sarah A.....	Cresco.....	Howard.
Wright, J. A.	Des Moines.....	Polk.—143.

STUDENTS NOT FULLY ACCEPTED AS FRESHMEN.

Ankeny, Harry H.....	Clinton.....	Clinton.
Beedle, James A.....	Ontario	Story.
Brown, Olive.....	Iowa City.....	Johnson.
Cartwright, Fannie K.....	Decorah	Winneshek.
Chamberlin, A. M.....	Cambridge	Story.
Chamberlin, Belle.....	Cambridge	Story.
Dudley, Mary A.....	Ontario	Story.
Geddes, Phoebe	Ames.	Story.
Gilbert, Edward	Ames.	Story.
Henely, William E.....	Monticello.....	Jones.
Hoggatt, Ella.....	Ames.....	Story.
Hoggatt, Volney.....	Ames.....	Story.
Hopkins, R. J.....	Swede Point.....	Dallas.
McElyea, Samuel.....	Ames.....	Story.
McGrew, B. H.....	Marshall	Marshall.
Merritt, William S.....	Seymour.....	Appanoose.
Mitchell, Cassie.....	Ames.....	Story.
Orser, Eugene.....	Ames.....	Story.
Phelan, Mary.....	Boone	Boone.
Prime, Angie.....	Ames.....	Story.
Provost, Geo. B.....	Dubuque.....	Dubuque.
Rogers, Mrs. A.....	Nevada	Story.
Sadler, Charles M.....	Dubuque.....	Dubuque.
Schodde, Augusta F.....	Monticello	Jones.
Schodde, William H.....	Monticello	Jones.
Schroeder, Bernard.....	Garnavillo	Clayton.
Truesdell, Lottie A.....	Ontario	Story.
Welch, Genevieve.....	Ames.	Story.
Welch, Harry.....	Ames.....	Story.
Weatherwax, H. E.....	Waterloo.....	Black Hawk.
Wickersham, E. H.....	La Moille.....	Marshall.
Wilson, George W.....	Cambridge.....	Story.—32.

SPECIAL STUDENTS.

NAME.	POST-OFFICE.	COUNTY.
Elden, William.....	Jefferson.....	Greene.
Foster, Luther.....	Monticello.....	Jones.
Robinson, Willis O.....	Vinton.....	Benton.
Schee, O. M.....	Indianola.....	Warren.—4.

CATALOGUE FOR 1875.—SENIOR CLASS.

Cadwell, Edward P	Independence.....	Buchanan.
Chamberlin, Albert P.....	Cambridge.....	Story.
Cherrie, Millah M.....	Knoxville.....	Marion.
Cunningham, Alice.....	Knoxville.....	Marion.
Curtis, Lizzie	Independence	Buchanan.
Haycock, Junnie B.....	Richland.....	Keokuk.
Kelley, Rinaldo P.....	Butler.....	Keokuk.
Lamoureux, William R.....	Sac City.....	Sac.
Lee, Charles H.....	Onawa.....	Monona.
Lyman, Hannah P.....	Boonsboro.....	Boone.
Macomber, Frank J.....	Lewis....	Cass.
Neal, Celestia A.....	Davenport	Scott.
Palmer, Thomas L.....	Washington.....	Washington.
Patrick, Herbert R.. ..	Independence	Buchanan.
Peterson, Charles E.....	Panora.....	Guthrie.
Ross, Ida.....	Nevada.....	Story.
Rudolph, Martin E.....	Manchester.....	Delaware.
Sherman, Bertie.....	Cresco.....	Howard.
Sherman, Ida.....	Fredericksburg....	Chickasaw.
Smutz, Eli J.....	Polk City	Polk.
Thornton, Lucius C.....	Cedarville.....	Pocahontas.
Wattles, Mason J.....	Glidden	Carroll.
Whitaker, James M.....	Hook's Point.....	Hamilton.
Wills, Nancy.....	Boone.....	Boone.
Wilson, Elizabeth.....	Traer.....	Tama.—25.

JUNIOR CLASS.

Aitken, Martin I.....	Mason City.....	Cerro Gordo.
Barker, Arthur P.....	Camanche.....	Clinton.
Bartle, Addie L.....	Independence.....	Buchanan.

NAME.	POST-OFFICE.	COUNTY.
Beard, Lewis W	Frankville	Winneshiek.
Blodget, Albert M.....	Le Mars.....	Plymouth.
Blodget, Julia C	Le Mars.....	Plymouth.
Bouck, Ira W.....	Independence.....	Buchanan.
Claussen, Lorents A.....	Afton.....	Union.
Cobbey, Joseph E	Vinton	Benton.
Collins, Winfield S.....	Solon.....	Johnson.
Coykendall, Maud.....	Rock Falls.....	Cerro Gordo.
Crow, Benjamin F.....	Woodbine.....	Harrison.
Dudley, Winnifred M.....	Ames.....	Story.
Fegtly, John J.....	Utica.....	Van Buren.
Fish, Henrietta A.....	Eddyville	Wapello.
Garard, George A.....	Riverside	Washington.
George, Frank W	Williamstown	Chickasaw.
Gilmore, William T	Tipton.....	Cedar.
Goodspeed, Weston A	Lexington.....	Washington.
Hainer, Eugene J.....	New Buda	Decatur.
Hardin, James F	Steamboat Rock ...	Hardin.
Harlow, Ellen W.....	Ames	Story.
Hitchcock, Abner E	Anamosa.....	Jones.
James, William M.....	Ames	Story.
Kellogg, Howard M	Corydon	Wayne.
Lonsdale, John D	Dale City.....	Guthrie.
McElyea, Charles W.....	Ames	Story.
McFadden, George B.....	Ames	Story.
McIntire, Charles C.....	Wilton Junction...	Muscatine.
Mead, Ellie E.....	Cresco	Howard.
Merritt, James A.....	Montour	Tama.
Moyer, Flora.....	Jesup.....	Black Hawk.
Northrup, James O.....	Strawberry Point ..	Fayette.
Scott, Henry N.....	Wheatland	Clinton.
Shaw, Arvin B.....	Tipton.....	Cedar.
Sheldon, Dwight D.....	Iowa Center.....	Story.
Snell, Joseph J.....	Ogden	Boone.
Spencer, Louis E.....	Grinnell.....	Poweshiek.
Stickney, John S	Vinton.....	Benton.
Twinting, Theodore F.....	Mount Pleasant....	Henry.
Whiting, Frank H	Mount Pleasant....	Henry.
Woodward, Walter M	Marshalltown.....	Marshall—42.

SOPHOMORE CLASS.

NAME.	POST-OFFICE.	COUNTY.
Anthony, Fred. H.	Camanche	Clinton.
Beadle, Emma G.	Cresco	Howard.
Beadle, Lottie C.	Cresco	Howard.
Beard, Angie M.	Frankville	Winneshiek.
Booth, F. W.	Anamosa	Jones.
Buchanan, Butler.	Mt. Pleasant	Henry.
Cahill, Margaret E.	Fort Dodge	Webster.
Campbell, Alfaretta J.	Washington	Washington.
Carpenter, Mary C.	State Center	Marshall.
Colclo, Craton C.	Carroll	Carroll.
Clark, Fanny E.	Independence	Buchanan.
Corbin, Joseph F.	Tiffin	Johnson.
Crew, Mary A.	Lyons	Clinton.
Curtis, Catharine S.	Independence	Buchanan.
Dickson, David	Glidden	Carroll.
Doxsee, Jacob W.	Bowen's Prairie	Jones.
Eaton, Walter A.	Boone	Boone.
Fairchild, ———	Ames	Story.
Fensler, William H.	Missouri Valley	Harrison.
Farwell, Mary E.	Monticello	Jones.
Garard, Mary	Washington	Washington.
Grattan, Mary	Waukon	Allamakee.
Hainer, Julius C.	New Buda	Decatur.
Hargrave, Almar P.	Atalissa	Muscatine.
Helsell, William A.	Clarence	Cedar.
Hungerford, John B.	Burlington	Des Moines.
Hunt, Wilber N.	Ames	Story.
Jordan, Richard F.	Ontario	Boone.
Keith, Cora B.	Vinton	Benton.
King, Edwin L.	Vinton	Benton.
Leas, William A.	Des Moines	Polk.
Lee, Thomas F.	Oelwein	Fayette.
Lewis, Harry P.	Orange City	Sioux.
Locke, Catharine N.	Vinton	Benton.
Meredith, Joseph C.	Holt	Taylor.
Merrill, Fred. E.	Columbus Junction	Louisa.
Miller, George I.	Louisville	Audubon.

NAME.	POST-OFFICE.	COUNTY.
Milnes, J. C.....	West Liberty.....	Cedar.
Moyer, Alexander.....	Jesup	Black Hawk.
Neal, Alice.....	Davenport.....	Scott.
Patty, Cora M.....	Redfield.....	Dallas.
Robinson, Lyman B.....	Belle Plaine.....	Benton.
Roe, George W.....	Polk City.....	Polk.
Sanford, A. M.....	Winthrop	Jones.
Sanford, W. Y.....	Winthrop	Delaware.
Shearer, Belle.....	Ames.....	Story.
Smith, Thomas.....	Ames	Story.
Soper, Charles M.....	Ontario.....	Story.
Sry, George E.....	Durant.....	Scott.
Stratton, Fabin L.....	Alden....	Hardin.
Voris, George A.....	Vinton.....	Benton.
Welch, William B.....	Ames.....	Story.
Waldron, Lou.....	Nevada.....	Story.
Watters, Walter P.....	Atalissa....	Muscatine.
Whited, Alice....	Alden....	Hardin.
White, Harley M.....	Vinton.....	Benton.
Will, James F.....	Iowa Center.....	Story.
Wright, James A....	Des Moines.....	Polk.
Wattles, W. T.....	Glidden.....	Carroll.—59.

FRESHMAN CLASS.

Bagley, G. I.....	Tipton.....	Cedar.
Banfill, Charles C.....	Waukon.....	Allamakee.
Baughman, Laura.....	Ontario.	Story.
Barnes, H.....	Ames.....	Story.
Beauchamp, James.....	Bedford.....	Taylor.
Bloom, Robert John Walker.....	Garner.....	Hancock.
Bonbright, Charles H.....	Des Moines....	Polk.
Brewer, Charles T.....	Boone.....	Boone.
Brewster, Ada	Alden.....	Hardin.
Brown, Flora E.....	Wheatland....	Clinton.
Brown, Silas M.....	Clarinda.....	Page.
Brown, O. S.....	Willow Grove.....	Story.
Brush, J. B.....	Timber Creek.....	Marshall.
Buell, William E.....	Lyons....	Clinton.

NAME.	POST-OFFICE.	COUNTY.
Burtch, A. E.....	Des Moines.....	Polk.
Butler, Frank G.....	Glidden.....	Carroll.
Burke, Richard.....	Keokuk.....	Lee.
Casebeer, Charles S.....	Tipton.....	Cedar.
Chamberlin, Marcus A.....	Cambridge.....	Story.
Chamberlin, Belle.....	Cambridge.....	Story.
Charles, Frank C.....	Cedar Rapids.....	Linn.
Cobbey, Thomas Dick.....	Vinton.....	Benton.
Collister, C. H.....	Belle Plaine.....	Benton.
Cooke, George.....	Independence.....	Buchanan.
Crow, Ellen.....	Woodbine.....	Harrison.
Croy, Elizabeth.....	Ontario.....	Boone.
Deane, May E.....	Waukon.....	Allamakee.
Devoss, Winfield S.....	Waveland.....	Pottawattamie.
Drennen, James F.....	Princeton.....	Scott.
Dudley, Mary.....	Ontario.....	Story.
Ericson, Joseph.....	Mineral Ridge.....	Webster.
Everhart, J. W.....	Eldora.....	Hardin.
Farlow, William N.....	Bedford.....	Taylor.
Finch, Daniel E.....	Cambridge.....	Story.
Forest, Cyrus M.....	Glidden.....	Carroll.
Fowle, Abby.....	Clarksville.....	Butler.
Frazier, Alma.....	Nevada.....	Story.
Freed, Alice.....	Ames.....	Story.
Geddes, Patricia, L.....	Ames.....	Story.
Gilbert, E.....	Ontario.....	Story.
Glenn, Harvey L.....	Clarksville.....	Butler.
Grace, William.....	Dixon.....	Scott.
Griffith, Amos P.....	Story City.....	Story.
Hambleton, L.....	Nevada.....	Story.
Hitchcock, James.....	Mondamin.....	Harrison.
Hitchcock, Milan.....	Anamosa.....	Jones.
Hoag, Don A.....	Waukon.....	Allamakee.
Hoggatt, Volney.....	Ames.....	Ames.
Humphrey, Edgar C.....	Charles City.....	Floyd.
Hutt, Jackson M.....	Indianola.....	Warren.
Hyman, William.....	Camanche.....	Clinton.
Johnson, Charles S.....	Clarinda.....	Page.
Johnson, W. J.....	Le Claire.....	Scott.

NAME.	POST-OFFICE.	COUNTY.
Jones, William E.....	Grant City.....	Sac.
Keigley, Eugene A.....	Ames.....	Story.
Kellogg, Clara.....	Dunlap	Harrison.
Kellogg, Rosa C.....	Ames.....	Story.
Kennedy, George F.....	Russell.....	Lucas.
Kimberly, Charles C.....	West Liberty.....	Cedar.
Langworthy, Ida.....	Monticello	Jones.
Letts, Hilton M.....	Lettsville.....	Louisa.
Little, Charles.....	Council Bluffs.....	Pottawattamie.
Lonsdale, Mary.....	Dale City	Guthrie.
Manbeck, Alice S.....	Des Moines.....	Polk.
Martin, Charles B.....	State Center.....	Marshall.
Mason, John L.....	Carlisle	Warren.
McConnon, Wm. G.....	Monticello	Jones.
McCoubry, Kate.....	Missouri Valley....	Harrison.
McElyea, Jennie.....	Ames.....	Story.
McGrew, Charles H.....	Sigourney	Keokuk.
McHenry, Emma.....	Des Moines.....	Polk.
McHenry, Sarah E.....	Des Moines.....	Polk.
McKim, John R.....	Deloit.....	Crawford.
McGriff, William A.....	Des Moines.....	Polk.
McKinnon, David.....	Florence	Benton.
Mount, Charles F.....	Mt. Pleasant.....	Henry.
Muncey, John N.....	Jesup.....	Buchanan.
Muhs, George.....	Camanche.....	Clinton.
Munson, M. I.....	Jacksonville.....	Chickasaw.
Myers, Josephine.....	Independence.....	Buchanan.
Noble, John.....	Monroe.....	Jasper.
Nowlin, Clark C.....	Princeton.....	Scott.
Olds, Eva Maud.....	Davenport.....	Scott.
Owen, Elizabeth.....	Logan.....	Harrison.
Perkins, Abbie J.....	Ames....	Story.
Parkhurst, Dudley M.....	Princeton.....	Scott.
Phelan, Mary.....	Boone.....	Boone.
Pritchard, Adda M.....	Alden	Hardin.
Pritchard, William C.....	Camanche.....	Clinton.
Pugh, Augustus L.....	Redfield.....	Dallas.
Rice, Ellen.....	Jesup.....	Black Hawk.
Richards, Wyman C.....	Spencer.....	Clay.

NAME.	POST-OFFICE.	COUNTY.
Robbins, William K.....	Redfield	Dallas.
Rodearmel, Gallagher M.....	Nevada.....	Story.
Saylor, John F.....	Saylorville.....	Polk....
Schodde, Augusta.....	Monticello	Jones.
Schodde, William.....	Monticello	Jones.
Shepard, Lucy.....	Masonville... ..	Delaware.
Sherman, Minnie.....	Fredericksburg	Chickasaw.
Sigafoos, Josiah.....	Columbus City.....	Louisa.
Smart, Luseba M.....	Des Moines.....	Polk.
Smart, Samuel A.....	Des Moines.....	Polk.
Taylor, Lucretia.....	Alden.....	Hardin.
Tupper, Holmes	Des Moines.....	Polk.
Tupper, Margaret.....	Des Moines.....	Polk.
Twitchell, Ida.....	Redfield.....	Dallas.
Tyler, Ernest G.....	Dunlap	Harrison.
Van Fossen, Horace.....	Adel.....	Dallas.
Van Voast, George W.....	Clinton.....	Clinton.
Welch, Genevieve.....	Ames.....	Story.
Welch, Horace G.....	Downing.... ..	Cedar.
Wilson, Anna B.....	Davenport.....	Scott.
Wilson, George W.....	Cambridge.....	Story.
Whitney, Warren J.....	Prairieburgh.....	Linn.
Wills, Anna.....	Boone.....	Boone.
Wills, G. F.....	Boone.....	Boone.
Wright, Ella.....	Nevada.....	Story.
Wood, Curtis A.....	Iowa Center.....	Story.—118.

STUDENTS NOT FULLY ACCEPTED AS FRESHMEN.

Beedle, James A.....	Ames.....	Story.
Bird, W. E.....	Belle Plaine.....	Benton.
Burns, K. E.....	Des Moines.....	Polk.
Crossman.....	Ames.....	Story.
Diggins, E.....	Ames.....	Story.
Faucet, L. W.....	Cedar Rapids.....	Linn.
Geddes, Phæbe.....	Ames.....	Story.
Harris, W. J.....	Des Moines.....	Polk.
Harrison, Mary E.....	Ontario.....	Story.
Hill, F.....	Ontario.....	Story.

NAME.	POST-OFFICE.	COUNTY.
Hutchison, R. P.....	Ontario	Story.
Hutchinson, W. H.....	Sioux City..	Woodbury.
Jones, Kittie.....	State Center.....	Marshall.
McCarthy, Willard.....	Ames.....	Story.
McElyea, Samuel.....	Ames.....	Story.
Osborne, Eldora.....	Des Moines.....	Polk.
Palmer, C. S.....	Vinton... ..	Benton.
Pattee, J. E.....	Boone.... ..	Boone.
Perkins, Minnie.....	Ames.....	Story.
Prime, Belle.....	Ontario	Story.
Ross, William J.....	Traer.....	Tama.
Shearer, James D.....	Ames.....	Story.
Shearer, Thomas W.....	Ames.....	Story.
Saylor, C. F.....	Saylorville.....	Polk.
Sheldon, Caroline A.....	Iowa Center.....	Story.
Smith George O.....	Ames.....	Story.
Smith, O. M.....	Mechanicsville....	Cedar.
Truesdell, Charlotte A.....	Ontario	Story.
Welch, Harry.....	Ames.....	Story.—29

SPECIAL STUDENTS.

Arthur, J. C.....	Charles City.....	Floyd.
Harvey, Frank L.....	Springvale.....	Humboldt.
Wellman, C. P.....	Forest City.....	Winnebago.
Waggener, W. J.....	Fayetteville.....	Arkansas.—4

SUMMARY.—1874.

Seniors.....	19
Juniors	28
Sophomores	69
Freshmen	143
Partial Freshmen.....	32
Special students.....	4
<hr/>	
Total	295

1875.

Seniors.....	25
Juniors.....	42
Sophomores	59
Freshmen	118
Partial Freshmen.....	29
Special students	4
<hr/>	
Total	277

GRADUATES IN 1874.

Gentlemen.....	14
Ladies	5
<hr/>	
Total	19

GRADUATES IN 1875.

Gentlemen	11
Ladies.....	9
<hr/>	
Total.....	20
Graduates in 1872 and 1873.....	41
Whole number of graduates	80

CONDITIONS OF ADMISSION.

No student of either sex can be legally admitted under the age of sixteen. No student will be admitted for less than a term, and none will be permitted to leave before its close, except on account of ill health or other serious reasons not foreseen at the time of entering.

Applicants must be residents of the State and able to pass a satisfactory examination in Reading, Spelling, Writing, Arithmetic, Geography, and English Grammar. They are required to understand the simpler processes of Algebra.

Candidates may make direct application to the President of the College, by letter, between the first and twentieth of January. By law three are admitted from each county ; but should any county fail to apply, the deficiency may be made up from other counties.

EXPENSES.

Students pay actual cost for board, fires, lights, laundry, damages to college property when caused by themselves, care, lighting, warming, and general repairs of the College building and furniture, and such other incidental expenses as specially belong to them as a body.

Students pay nothing for tuition or room rent, nor for the general expenses of the College.

Damages to college property will be charged to the person damaging the same when known, but if its author is undiscovered it will be *assessed* upon the section where it occurs, or upon the whole school.

Students supply themselves with pillows and other bedding, with towels, and with carpets if they desire them. They supply themselves also with ticks, which can be filled with straw after their arrival.

The rates of charges are as follows :

Board, per week.....	\$2.65
Fires and lights, per week.....	.47
Incidental expenses, per week.....	.25
Laundry, average per doz., about.....	.60

As the boarding department of the College is self sustaining, receiving no aid from the State, depending entirely upon receipts from

students to pay expenses, there can be no free admission to its tables. Students or other persons bringing friends are required, therefore, to pay at the rate of twenty-five cents per meal for each such friend before admission to the dining hall.

The conduct of students in the dining hall, during meals, is under the supervision of one of the professors, and is required to be in harmony with the strictest propriety.

The provisions purchased for the boarding department are of the very best quality that can be procured in the market, the aim being to furnish well cooked, substantial and nutritious food.

DEPOSIT.

Accepted candidates will deposit fifteen dollars each, with the Treasurer, as a security for the payment of their bills, and have their names entered upon his books ; after which they are considered members of the College, and are entitled to all of its privileges.

MONTHLY SETTLEMENT.

Students will settle all bills for each month at the cashier's office, on the second Saturday of the month following, the original deposit being retained till final settlement. The necessity for prompt settlement is imperative, and any student who neglects this duty, except for reasons satisfactory to the President, may be dismissed by him for such neglect.

CARE OF MONEY AND VALUABLES.

Students may, if they desire, deposit money and other valuables with the Treasurer for safe keeping. While the College authorities will do all in their power to recover lost articles, and to prevent and punish theft, the College cannot be responsible for such losses or thefts from the persons or rooms of students.

SPECIMEN EXAMINATIONS.

Below are given specimen examinations. Of course it will be understood that they are only *specimens* and not the actual ones which will be given to the applicant. Seventy-five per cent. of the questions must be answered in order that the candidate be received.

GRAMMAR.

1. Name and define the parts of speech in the following sentence:

"Maud Muller on a summer's day
Raked the meadows sweet with hay."

2. Parse "had gone" and "came," in the sentence "Mary had gone before her mother came."

3. Analyze the following sentence:

"His house was known to all the vagrant train;
He chid their wanderings, but relieved their pain;
The long remembered beggar was his guest,
Whose beard, descending, swept his aged breast."

ARITHMETIC.

1. Divide 320,000,421 by 320.
2. Get the greatest common divisor of 7,030, 1,900 and 7,410.
3. Reduce $\frac{\frac{5}{12} \times \frac{36}{25}}{\frac{7}{1} - \frac{1}{3}}$ to its simplest form.
4. Multiply 3,145 by .0004.
5. Divide .00045 by .000005.
6. Divide 3 miles, 10 ft., 9 inches, by 10.
7. Get the bank discount on \$729.34 for 1 year and 27 days, at $9\frac{1}{2}$ per cent.
8. If 10 horses eat 180 bushels of oats in 60 days, how long will 240 bushels last 30 horses?
9. Get the square root of 81,039 to three decimal places.
10. Get the cube root of 65 to three decimal places.

ALGEBRA.

1. From $3a^2bc - 21ab^2d$ subtract $5a^2bc - 24ab^2c$.
2. Divide $-3a^{-4}$ by a^2 .
3. Divide $a^6 - b^6$ by $a - b$.
4. Resolve $a^{16} - b^{16}$ into five factors.
5. Find the greatest common divisor of $3x^4 + 4x^3 - 6x^2 - 12x - 5$ and $3x^5 - 6x^4 - 18x^3 + 12x^2 + 39x + 18$.

GEOGRAPHY.

1. Bound New York, Alabama, Michigan, and Texas, and name their capitals and chief cities.
2. On a voyage by water from Duluth to New York City, through what waters would you pass, near what States, and what important cities would you pass?
3. How would you go by water from Chicago to St. Petersburg?
4. Name the important seas, countries, and cities of Europe and Asia.
5. Name the most important rivers of South America, and give their positions.
6. On a voyage from Portland to Van Couver's Island, through what waters would you pass; what capes and large cities would you go near?

SPELLING.

Intelligent	Courageous	Retina
Panegyric	Efficient	Traveler
Evanescent	Embrasure	Macaulay
Actuate	Whipped	Satirical
Especially	Until	Dactyl
Occurred	Separate	Operate
Courtesy	Panoply	Ambulance.

GOVERNMENT AND CODE.

The system of government under which the institution is conducted, has grown out of its organization and the purposes it is designed to accomplish. The addition of manual labor to the various courses, makes perfect regularity and promptness indispensable on the part of every student. Young men and women are earnestly advised not to apply for admission to the college, unless they can cheerfully submit to wholesome regulations.

The following well considered rules, if obeyed, give the institution the highest efficiency, and secure for the student the largest possible return for time and expense.

Each student will hereafter sign this code, as an assurance of his acceptance and hearty sympathy with law and order.

SYNOPSIS OF THE COLLEGE CODE.

STUDY, RECITATION AND LABOR.

1. The hours from seven to ten o'clock on work-day evenings, and from 7:15 A. M. to 12 M., and 1:30 P. M. to 4:45 P. M., of all week days except Saturday, are devoted to study, recitation and labor.

2. Students shall attend promptly all exercises of classes to which they belong. The recitation for an excused absence from class, shall be made up within two weeks from such absence.

3. Examinations shall be conducted in writing, when possible, upon questions proposed by the instructors of the various classes, and no special examination will be granted except in cases of sickness or unavoidable absence.

4. No student shall graduate from this College who has not passed an examination and obtained a standing of *three* (four being perfect) on each of the studies of the course in which he proposes to graduate. Studies which are pursued for a part of a term, or a part of the time during any term, shall be counted proportionately to such part.

5. Ten students shall be selected from each graduating class to speak at the College Commencement. The basis of such selection shall be : scholarship in the regular course of study pursued ; proficiency in elocution and rhetoric, and the student's good conduct during his stay in College.

6. Students are detailed for labor by the President, and work as directed, an average of two hours and one-half per day, for five days in the week.

COLLEGE SOCIETIES.

The President or Faculty must in all cases be consulted by the students, before organizing any literary, scientific, or other society. The members of such duly organized society may meet for improvement, during the study hours of such evenings as may be designated by the President or Faculty. Their meetings may, if necessary, hold till 10 P. M., and in such cases the retiring bell shall be rung at 10:30 P. M.; but in no case shall attendance upon the meeting of any society be construed to excuse students from a strict observance of study hours after adjournment.

THE SABBATH, AND WORSHIP.

1. Students shall duly observe the Sabbath by maintaining a proper degree of quiet and order in and about the College.
2. Students will assemble in the Chapel once in each day for prayers, and on every Sabbath afternoon for public worship.

INSPECTION.

On each week-day morning, at inspection hour, students shall have their rooms open and ready for inspection, and upon Saturday morning, at least one occupant, or some representative, shall be present at such inspection.

EXCUSES.

1. When students have been absent from any exercise, they shall in person, as soon as possible, present their reasons for such absence, to the President.

OBSERVANCE OF BY-LAWS.

2. Students shall strictly observe the by-laws pertaining to any of the departments of the College.

PROHIBITORY LAWS.

1. Students may not leave the vicinity of the College building at any time without permission from the President. General permission to be absent on Saturday, is given by the President.

2. Loud talking, whistling, scuffling, gathering in halls, and staircases, and boisterous and noisy conduct are *at all times* forbidden.

3. During study hours, when not engaged in work or recitations, students may not leave their rooms, except for unavoidable reasons approved by the presiding officer of the section.

4. At ten o'clock P. M., lights shall be extinguished, and from this time till the rising bell no student may be out of his room, except for unavoidable reasons, nor shall he in any way disturb his neighbors.

5. Students may not abstract or remove any article, whether clothing, food, furniture, tools, fruit, or any other property belonging to the College.

6. Card playing, and other games of chance, cooking, and the use of tobacco and intoxicating beverages, are strictly forbidden in any of the College buildings.

STUDENT GOVERNMENT.

1. At the beginning of each term, there shall be elected from each section, one Councilman, one Captain, and one Lieutenant, and such election shall be valid upon approval by the President, *provided* that no student who is a lawbreaker shall be eligible to such offices.

2. It shall be the duty of each Captain, or, in the Captain's absence, of the Lieutenant, to preserve order in his section, according to law, and to report all violations of law to the Councilman of his section, who shall present the same to the Council at its next meeting. The Captains and Lieutenants will meet once each week with the President of the College, for informal report as to the condition of the government in their sections, and to consult as to the best means of securing harmony and efficiency of action.

3. The Council shall organize by choosing a president and a secretary from its own members, whose duties shall be the ordinary duties of such officers in deliberative assemblies. The Council shall hold regular meetings each week for the purpose of trying such offenses, and only such, as are reported.

4. In all trials, the President of the Council shall preside as Judge, and he shall appoint one member thereof to conduct the prosecution. The accused shall be present during his trial. He may have a member of the Council appointed as his attorney, and he shall have the privilege of cross-questioning witnesses in person or by his attorney.

5. In any trial, the testimony of the officer reporting the offense, that of all other competent witnesses, and admissions made by the accused, shall be received in evidence.

6. The verdict, and the number of demerits, shall each be given by vote, in which the President shall have only the casting vote, and no member shall be debarred from voting on account of giving evidence in the case.

7. It shall be the duty of the Council to report its proceedings to the Faculty, weekly, for approval.

8. When a student officer has been reported to the Council for any misdemeanor, the Council shall, without trial, refer the case to the Faculty.

9. Whenever it shall appear that the members of any section are not able to maintain good order, and the disorder shall not seem curable by other and milder means, the President may vacate the rooms in such section.

10. When the demerits of any student reach five in number, he will be warned by the President in private; when his demerits reach ten, the President will again warn him, and advise his friends of such action, with the reasons therefor; for fifteen demerits, he shall be requested to withdraw from the College.

11. The Faculty reserve the right to try or rehear, all cases of disorder, disobedience or immorality, when circumstances demand it.

12. The Faculty reserve the right to expunge the demerit marks of any student upon his subsequent blameless conduct.

NEW HEATING APPARATUS NEEDED.

As a means of warming the main college building the Rutan furnaces were purchased and put in eight years ago. During the storms and high winds that occur frequently in spring and fall these furnaces have proved entirely inadequate. Indeed, both officers and students, and especially the young ladies, have suffered not a little from the failure to warm the building in cold weather. They are now worn out and many of them are cracked; the brick work that surrounds them is crumbling, and the timbers directly overhead have become so seasoned by hot air that any further use of these furnaces is extremely perilous to the building. For this reason the Trustees, at their June meeting, authorized the closing of the college year two weeks earlier than usual.

It is the opinion of all parties who have examined these old furnaces that they must be abandoned and replaced by an effective heating apparatus before the building can be again opened for the admission of students. Experience has fully proven that, in a climate like ours, steam is the only economical and effective method of heating large buildings. We are, therefore, compelled to ask of the Legislature, an appropriation of \$17,000 to be expended in the necessary fixtures for heating by steam. If such an appropriation can be made before the middle of February, the new arrangements for heating can be completed so that the institution can be again opened by the first of April. But if the appropriation be delayed much after that date it would greatly embarrass the working of the College the coming year, and seriously retard and injure the entire enterprise. The necessity is exceedingly urgent and we earnestly hope that the Legislature will furnish the means of relief among their first acts.

NEEDED REPAIRS OF THE COLLEGE BUILDING.

Thorough repairs of the College building cannot be longer delayed. Serious defects in its structure require immediate remedy. The walls of the north tower are of brick and seem to be settling from a lack of adequate support. Some means must be found for strengthening the pillars on which the inner angle of these walls rests. When the north wing was extended, in 1871, the outer wall of the old wing, to which the extension was joined, was left standing in two upper stories, but was removed in the lower story to make room for the lengthened chapel. Two iron columns were substituted for the wall so displaced and the whole weight of the wall above made to rest on these columns and on the lateral wall on either side. Several wide fissures in the superincumbent wall, give unmistakable evidence that the means of support are insufficient. R. S. Finkbine, a well known architect, who was employed by the board to examine this wall, expresses the opinion that it should be taken down and a much lighter one put up in its stead.

There is, moreover, a pressing need that the outside wood-work, such as cornice, frieze, window frames, and sashes, should be re-painted. The first painting was done eight years ago, and all outside wooden finishings being now nearly bare, are exposed to the danger of immediate decay. The whole interior wood-work of the building, with the exception of the library and a few rooms, also need graining, and some very thorough means should be taken to preserve the exterior walls from injury by rains. New gutters should be put in and the conductors made secure and perfect. All these repairs, with others which a competent architect will point out, are urged not only for the comfort of those who occupy the building, but as a measure of sound economy to the State.

Subjoined is the report of R. S. Finkbine, made from actual inspection of the defects referred to :

To the Board of Trustees of the Iowa State Agricultural College:

GENTLEMEN:—In response to the following resolution of your Board: “Ordered, that the Chairman of the Board be authorized to employ R. S. Finkbine to make a survey of the College building, and more particularly the north wing thereof, and to report in writing what alterations or repairs he may deem necessary for the safety and proper preservation of the building ; and also to report upon the safety and

sufficiency of the present heating apparatus, and what changes, if any, are necessary therein ; and the approximate cost of all the work he may recommend," I herewith report that I have made the examination above contemplated. I find that the two towers on the front of the building are plumb; the inside corners of these towers are supported by piers in the cellar, and iron columns from there to the square of the building. At each story there is a wooden girder between the columns, making in the entire height, four feet of wood; in this the shrinkage and compression are from three to four inches. This settlement has caused the inner walls of the towers to crack the entire height, from the square of the building to the corner of the tower. These walls should be taken down and re-built.

When the north wing was extended, the then rear wall of the chapel was removed and the chapel extended. The two upper stories of brick, one twenty-one and the other sixteen inches thick, were left ; to support this wall, a wooden lintel was put in, resting near the center on two iron columns, and between the columns and outer walls having a clear span of fourteen and two-twelfths feet. Each of these outer spans is now carrying a load of thirty-five tons. To relieve this lintel, an arch was thrown over it; the shrinkage of the wooden lintel and the thrust of the arch have spread the side walls, bulging them out as high as the story, and settled and cracked the partition wall.

I recommend that this heavy partition wall be taken down ; and that the side walls, where bulged out of line, be also removed. The wooden girder should be replaced by a rolled iron girder, made of two ten-inch I beams; the removed partition of the side walls be re-built ; the partition wall be re-built thirteen inches in thickness, and bonded into the side walls.

The heating apparatus, is not of sufficient capacity to properly warm the building, even if in good condition. Most of the furnaces are burned out, and all with one or two exceptions are dangerous. The sub-cellar in which these furnaces are located is entirely too low for the purpose.

The iron work of the furnaces projects above the lower line of the joist. The joist in most instances being half cut away in order to make room for the furnace—over the iron work a brick arch is placed. The expansion of the heated iron cracks this almost as soon as put up. I consider these furnaces absolutely dangerous, and think they should be removed at once. In my judgment, the attempt to properly heat so large a building as the College, in this climate, with hot air furnaces, will be a failure. The best substitute is steam. The best way to do

this, is to erect an engine, boiler and coal house, considerably in the rear of the present buildings, with a main duct leading to the central building, and wings. Many of the air ducts now in, will be used in this system, as well as the registers you now have.

The entire exterior wood work of the buildings is suffering for paint, and should as soon as possible, be repainted and sanded. The tin roofs, gutters, valleys, and conductors, should be repainted. There are also some badly needed repairs in the water-closets. The floors should be covered with five lb. sheet lead, the tanks lined with lead, and the soil pipes changed in location.

The floors of the halls and corridors should be relaid with hard wood. The inside wood work should all be repainted, and the plastering (which is badly cracked and discolored) needs repairing and kalsomining. The exterior brick work would be improved in durability and appearance if it was painted.

The estimates for these repairs and changes, are as follows :

For engine house and air ducts.....	\$ 6,000.00
For heating apparatus complete.....	17,000.00
Rebuilding brick walls.....	1,400.00
Repainting building, exterior.....	1,000.00
Painting brickwork.....	1,500.00
Changes and repairs to water-closets.....	600.00
Repairs to interior wood work	1,600.00
Painting interior wood work.....	800.00
New gutters and conductors.....	420.00
Repairs to plastering.....	1,400.00

Total.....\$31,720.00

Respectfully submitted,

R. S. FINKBINE.

MORE ROOM NEEDED FOR THE DEVELOPMENT OF THE AGRICULTURAL COLLEGE.

It is clearly for the interest of the State that the Agricultural College should be developed until it attains the highest degree of usefulness of which the enterprise is capable. For the last four years its growth has been seriously checked for want of room. The building and the few boarding houses in its vicinity will, when filled to their utmost capacity, accommodate an aggregate of less than three hundred students. With

ample room, and with the doors thrown open to all applicants in the State of the proper age and attainments, the number in attendance would soon be doubled. The income of the College, its equipments, and with a small addition to its faculty, are sufficient for the instruction of five hundred students. Under the method of admission to the College now prescribed by law, the applicant is compelled to open a prolonged and tedious correspondence with the President from three to nine months before the opening. But if the capacity of our building could be increased so as to be adequate to the numbers applying, and the condition be limited to the fitness of the pupil, the public demand in Iowa for higher industrial education would be more fully supplied. It is not the lack of facilities for instruction, but the lack of room that now trammels the further development of the Agricultural College.

The first question to be considered before asking aid from the State to relieve this necessity is, how can substantial accommodations be added at the least possible expense? It is a well known fact that a number of small buildings, furnishing room for from eight, to twelve persons each, can be put up at less than one-half the cost required to erect one large building of the same aggregate capacity. Moreover, the small buildings would furnish opportunity to the young men to board in clubs, or to adopt any mode of housekeeping suited to their finances.

An investment of thirty-five thousand dollars would, it is believed, be sufficient to cover the expense of erecting twenty-four substantial, tasteful brick houses, which would give comfortable homes for nearly two hundred young men. This new arrangement, when carried into effect, would leave the college building wholly to the young ladies, who, after a number of rooms now used for dormitories have been changed to recitation rooms, will furnish quarters for double the number now in attendance. In short, thirty-five thousand dollars, a sum quite insignificant when compared to the investment already made, will enable us to domicile the sexes in different buildings, will double the number of students now in attendance, and make admission free to all applicants from any county of the State.

MANUAL LABOR.

In compliance with the law requiring manual labor, the students work regularly an average of two hours and a half a day. At the opening of the year the industrial departments are organized with great care. The young men are detailed in adequate numbers to the

farm, the garden, and the workshop ; and the young women are appointed to the different departments of the dining room and kitchen. Beside the arrangement made for daily manual labor in these regular departments, special details of advanced students, who have progressed in the manual practice attached to their course of study, are made for work in the museum, library, laboratory, mail-service, etc.

In this way the demand for help, in all the departments, is largely met by student labor. But it must be confessed that a system by which nearly all the varied work required in an enterprise like this, is carried on by students, has its defects. A regular daily service of two hours and a half, from two hundred persons of different age, capacity, and habits, cannot be systemized and made efficient without difficulty. And the difficulty is increased by the fact that these persons are more or less absorbed in preparing for daily recitation. Moreover, manual labor by the students in this institution is compelled by the necessities of the case to subserve purposes that are incompatible with each other. The work must be so adjusted as to meet in kind, quantity, and time, the wants of the farm, the garden, and the workshop ; while the law requires from the student a definite amount of labor which cannot be varied to suit the varying needs of the departments. For the first four years the College could furnish labor enough to meet the requirements of the law, but in the progress of improvements the supply of labor has exceeded the demand, and yet it cannot be legally diminished. Then further, it is held by many that the manual of an industrial college should be made to subserve a single purpose, namely : the acquisition of skill in the handicrafts connected with the industrial course of study. Such labor requires constant and close supervision, is not remunerative to the college, and cannot be paid for. On the other hand, it is a stubborn fact that a majority of our best students, especially in the lower classes, are dependent wholly on their own efforts for support while in college, and are consequently compelled to seek rougher work, that brings money, rather than the higher work, that brings expertness. Probably if the College should cease altogether to pay for uninstructional labor, fifty of our most earnest students must abandon the college course.

But conflicting as are the various objects which manual labor is required to accomplish, the College has measurably obtained them all. Under the instructions of the superintendents, most of the advanced students have adequate practice in the higher processes of industry. Nearly all the heavy work of the farm and other departments has been

borne by students largely from the Freshmen classes, under pay, and the regularity and amount of work throughout has fulfilled the requirements of the law.

The time however has now come when a modification of the law would enable manual labor to fulfill its purposes more completely. Beyond question, its most important purpose is to make experts in the nicer processes of industrial art. The special industrial courses of study commence at the opening of the Second Term of the Sophomore year. At this point the student chooses the industrial course he designs to pursue, and thereafter the labor he is required to perform should be simply educational and without pay. To effect its purpose in making experts in the handicrafts, this labor should be rendered in the highest degree instructive. It should be put under the same incitements and have the same supervision as the regular recitations. The professor in charge, whether of Agriculture, Horticulture, or Mechanics, should direct both the manual and intellectual exercises of his classes with equal care and completeness, and practice in industrial art should be required for graduation as strictly as scientific attainments. With such a scheme, carried out with systematic exactness, there can be no question that the Agricultural College will uniformly confer its diplomas on those who are at once scholars in science and adepts in industrial art.

In case any of the students in the special industrial courses should desire, in addition to the instructive labor required, to earn money by ordinary work, his voluntary services in any of the departments, if needed, might be accepted and paid for.

Meantime the Freshmen and Sophomores for the first year and a half are employed in studies which are antecedent to the special industrial courses. These classes are consequently not yet prepared for instructive labor. They generally wish to pay a portion of their expenses by means of work, and they can be regularly employed as heretofore in such ordinary labor as the farm and the garden require. A slight addition may be profitably made to the rate of pay for those who show unusual efficiency, and a small premium may be offered at the end of each month as a reward to faithfulness and perfect regularity.

This new arrangement for advanced classes will necessitate the appointment of a permanent foreman in Horticulture, and an additional officer whose duty shall be to give instruction in general Agriculture and to supervise the instructive labor on the farm. The present superintendent might, as heretofore, have charge of the farm, supervise its

ordinary labor, and enlarge the sphere of his instructions in the management of the domestic animals.

Subjoined are the rules under which manual labor has been conducted for the last four years.

The statute requires that all students shall engage in manual labor an average of two and a half hours per day throughout the College year. The following articles embody the system under which this department is conducted :

I. *Monthly Detail.*—On the first day of each month the President details an adequate number of workers for each Superintendent for the month. No change from one Superintendent to another is permitted during the month except on urgent reasons presented by the Superintendent.

II. *Superintendents' Reports.*—At the end of the month the several Superintendents report to the President the number of hours worked by each student under his charge, the rate per hour, the total sum earned by each, and the amount to be charged the several departments. These earnings are subtracted by the cashier from the students' monthly bills for board, etc.

III. *Pay.*—Students doing heavy work on the farm, or other unproductive heavy work in orchard, garden, kitchen, or elsewhere are paid according to efficiency, from three to nine cents per hour.

Students employed in the library, museum, or President's office, or in skilled labor in the garden, orchard, ornamental grounds, or elsewhere, under the instruction of the proper officer, are paid at the rate of from three to seven cents per hour.

Students laboring in the Workshop are furnished with tools and all needed instruction, but receive no compensation until their labor is of value to the College, when they are paid from three to nine cents per hour, deducting a moderate sum for the use of tools.

IV. *No Distinction by Reason of Sex* is made in rate of pay or choice of work, the rate paid per hour being settled, under rule III, by value of services.

V. *Surveying, Drawing and Laboratory Practice.*—Practice in Surveying, in Mechanical drawing, and in the Chemical Laboratory, so far as laid down in the time table, is regarded as labor within the meaning of the law, though not subject to pay.

VI. *General Details*.—Students in the Sophomore class for the first term, and in the Freshman class throughout the year, are detailed to such labor as the several departments of labor may furnish for the time being, their preference being regarded whenever practicable.

VII. *Instructive Labor*.—Sophomores for the second term, and Juniors and Seniors throughout the year, are required to do the work belonging to the course of study that they have selected, unless detailed elsewhere to answer the needs of the College.

A few Seniors who have special capacity in that direction are employed as foremen under the several superintendents.

VIII. *Supervision*.—All labor by students is supervised personally by some officer of the College, or a foreman under his direction.

SCOPE AND SPIRIT OF THE AGRICULTURAL COLLEGE.

The following Extract from an Address delivered by the President before the State Horticultural Society, at Burlington, gives a view of the Scope and Spirit of the Agricultural College:

In the first place, the Agricultural College is the creature of the law. Unlike your association which had a spontaneous origin to meet a special public want, the Agricultural College took its rise, shape and purpose, from an organizing act of the congressional grant. This act gives the entire organization a clear and definite outline by declaring, in precise terms, that “the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.”

Six years ago, in reporting the plan of organization to the Board of Trustees, I held that no doubtful construction of such language was possible—that the principal clause announces, in precise English, that the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts, and the gist of the adjuncts which set forth the final purpose, is to educate the industrial classes in

the several pursuits and professions of life. In accepting the congressional grant the State of Iowa accepted the conditions it imposes, and the Trustees had no alternative but to fulfill these conditions in an honest and liberal spirit.

If the objects of the institution are to teach the branches that are related to agriculture and the mechanic arts, then the leading courses should be largely composed of these branches; the leading professors should have these branches in charge, and the whole equipment of the institution should help to illustrate and give them prominence.

Then, further, the spirit of the law requires that the departments of agriculture and mechanic arts should be co-ordinate. By this, I mean that the grant contemplates that a full opportunity should be given to both, and not that both should be taught by an equal number of professors or attended by an equal number of students.

The enactment provides further that military tactics should be among the branches taught, but does not make instruction in it a leading object. It need hardly be added that the language of the grant, in not excluding other scientific and classical studies, implies simply that their instruction to an extent compatible with the leading objects, is not forbidden. Instruction in scientific and classical studies not connected with agriculture and the mechanic arts, is permitted, if such studies are deemed necessary, to give range and completeness to the college courses, but the creation of a department of general science and literature which should overshadow the departments essential to the enterprise, would be a manifest violation of the spirit and intent of the national law.

Such was the analysis I gave to the *Congressional law* at the opening of the Agricultural College, and I have since seen no reason to change it; growing, however, more and more in favor of the strictest construction that can be given. I will only add that the law evidently contemplates experimentation in agriculture whenever the leading objects are attained, by requiring that an annual report shall be made regarding "the progress of each college, recording any improvements or experiments made, with their cost and results."

In hearty recognition of the value of this riper work of the College, we have struggled onward against the obstacles of its early years—obstacles sometimes well nigh overwhelming, until we have at last reached the position where I may say, as I now say to the professor of horticulture and the others, whatever experiments within our means you think

best to inaugurate in response to the wishes of the Horticultural Society, you shall have our earnest help in carrying through,

In order to aid you to realize how nearly our organization is in harmony with law, I will say that we have no classics, that the permissible studies which are at all professional are mainly the English language, which every American ought to know, and that seven-eighths of all the branches taught at the College are "related to agriculture and the mechanic arts." In addition to this, the Trustees have lately established a shorter optional course in agriculture, consisting of specialties only, and lasting a single year.

Then, as to the requirement that the College should educate the *industrial classes*, I may safely say that, from the beginning, three-fourths of all our students have been farmers' sons and daughters, and that four-fifths belong to the so-called industrial classes. In view of these facts you may look in vain throughout the land for another Agricultural College which has so closely fulfilled the conditions of the enactment that gave it birth.

It is clear, then, that the foremost purpose of the Agricultural College is to shape and operate its departments of instruction; and this is a work of such magnitude as to absorb the energies of its earliest years. As indispensable to the new education which fits man for his actual duties, the College must organize, at the start, a library, museum, cabinets, laboratories, and must equip, at once, a workshop with all its machinery, a garden, vineyard and orchard, and a farm with its full supplies of buildings, implements, vehicles and fine stock, the whole to be conducted so as to illustrate the latest and best methods, and, above all, a corps of competent professors must be gathered from the four corners of the earth, must just suit a new latitude and fall into line without confusion. All these were so numerous and complicated that "Aladdin's lamp" was the only instrument by which they could be called into life soon enough to meet the demands of the new enterprise. But when this urgent and arduous work was to be accomplished, without delay, in a quarter of the State that was sparsely settled, on a farm where the plow had scarcely yet broken the virgin soil, and with a main building poorly supplied with water, heating, lighting and drainage, a task loomed up which required unparalleled energy and unyielding purpose to save it from immediate shipwreck. What wonder that the earliest acts of the College were the efforts of self-preservation? What wonder that its first work under the rule of manual labor, was to dig a sewer to save its walls from sinking and its pupils from the

fatal typhoid? And what wonder, also, that, in a large and thickly settled State, where errors are slow of correction, this first work should be taken as a specimen of our instructive labor henceforth?

But leaving this point, let me say that no equipment of museum or library, farm, garden or workshop, however complete, no corps of instructors however accomplished, can avail, of themselves, to make a great institution of learning. It must have students, earnest, intelligent, industrious students, animated by a single purpose, and in full sympathy with its leading objects. It must also be carried safely over all the perils of its infancy, by a uniform and healthy public sentiment. No other college in the land was ever sustained, in the hour of its trial, by such staunch and reliable friends, and, among these, may be reckoned all the way, its devoted Board of Trustees. Hundreds of unselfish men (beside these) who were fully acquainted with its system, gathered around it and stood like pillars in the very teeth of the storms that pelt with a pitiless fury every new institution of learning.

It was found, from the first, well nigh impossible to give to the general public a correct conception of the scope and purposes of the new enterprise. Not a few, in the lack of experience, envolved an Agricultural College out of their own fancies, and then demanded that the actual one should realize the capricious picture. To them the wealth of the College was boundless, its resources inexhaustible. It should furnish everything they wanted in the educational line, without stint and without expense. To some it was a sort of high public nursery, where children, found incorrigible at home, should be sent to gather the rudiments of knowledge, while undergoing reformatory treatment. To others it was a mere depository of general learning, where any kind and quality of knowledge could be called for and dispensed according to the taste of the applicant. Others, still, believed that the College was simply a *model farm*, where the boys, untrammelled by the study of science, were taught the handicrafts of agriculture and made to earn their living. Amid all these diversified views, not a few, with a clear perception of its leading objects, demanded, nevertheless, that the College should, Minerva like, spring into life in full panoply and enter, at once, upon those higher functions which are reached only after the progress of years.

The students at first reflected these sentiments. In their letters of application, they evinced every phase of the opinion that the resources of the College were unlimited, and that its charitable disbursements knew no bounds. Scores disclosed the belief, not only that tuition

was free, but that board was gratuitous also. Many more had imbibed the notion that board, clothing, and incidental expenses were all paid for by two and a half hours of manual labor per day. One young man who declared that he was a strong worker, asked, in effect, by letter, if, after paying in manual labor for his board, clothing and traveling expenses, there would not be something left over for the support of his poor but respectable parents at home.

From a few of these simple facts, and from the host of complicated departments to be got at once into running order, you will realize the stupendous task of holding the whole enterprise steadily to its leading objects as defined by the law. But through six eventful years, whether encouraged by praise or assailed by clamor, it has pursued its unwavering purpose of furnishing, for the industrial classes, a "liberal and practical education in the several pursuits and professions of life."

From the very first it was apparent that, in many respects, the character of the students who sought admission, was, on the whole, above the average. With many exceptions, the general fact remains, that more earnest young men and women never entered the portals of a college. In numbers, too, the applications have steadily exceeded the capacity of the building, and the actual attendance has been greater than any other Agricultural College in the country not having a preparatory department. But from first to last, they have shown a pretty uniform deficiency in two respects; first, a lack of adequate preparation for higher scientific studies; and second, a lack of means for meeting even the moderate expenses of our college course. The first lack made four years of study of these practical sciences, the shortest time in which the leading object could be attained, and the second lack made manual labor, as required by law, exceedingly helpful and salutary.

These were evidently the industrial classes contemplated in the Congressional grant. They had the ring of the genuine metal, but more than half were dependent wholly on their own exertions. Manual labor, while it kept up a healthy balance of brain and muscle, sustained a wholesome respect for industry, and worked off the restlessness of sedentary effort, at the same time paid from a quarter to a half the year's expenses. Then its application of science to practice could not be made, at once, on a crude farm, but with diligent effort such application could be reached as the years passed, and certainly it has greatly improved in this particular.

But this paper would be seriously defective if it did not notice the practical results of the new education on those who pursue it. Because

of the wide variety of views, I enter on this question with the utmost reluctance. One thing is certain, nothing as yet can be determined by the inspection of *actual samples*. A public project organized like yours for the improvement of *things* may reach an early fruition ; but a public project organized like ours for the moulding of *men* and *women*, can find its ripened fruit only in the distant future. Man making is slow business. Scarcely can a graduate attain such influence as to show the value of his education until after he has passed the middle age. The final worth of the industrial instruction at the Agricultural College, will appear only after its present conductor shall have gone to his rest.

It being impossible to get at final results, let us glance at a few points that bear on the question. A hundred, more or less, of the undergraduates of the Agricultural College, go back annually to the farms, carrying, we hope, new zeal and diligence. Scattered among the distant counties, they drop out of the public eye and are taken little account of. But the graduates, who, though fewer in number, are more conspicuous, do not, as yet, generally engage in the manual operation of the farm. I might say, what is surely true, that no institution in the land can be held to account for the pursuits its students engage in after graduation; and that such pursuits are settled by outside influences over which a college has no control. But I prefer to discuss the question in its actual bearing on the value of industrial learning.

1st. The agricultural graduates having, with some exceptions, expended their entire means in getting through College, have nothing left with which to purchase farms, and have invested too much in their education to engage as farm laborers. Even if they did, it would scarcely answer the design of the Agricultural College.

2nd. I have serious doubts whether the graduates could quicken the progress of agriculture by giving themselves up wholly to the *raising of crops*. The farmers of Iowa cannot be helped by adding to the mere bulk of farm productions which are already so great as to cause frequently a glut in the market. It is not an increased *compensation*, already too great, that the farms of Iowa need, but such an advance, rather, in the *skill* and *economy* of farm processes, that a wider margin may be left between the cost of production and the market price ; and the men who are helping most in this direction are not generally employed in the *raising of crops*. They fill the editorial chairs, they are in the student's office, in the laboratory or the workshop, or engaged wholly in observation and experiment. If there be any doubt of the

fact, I could give, at the present moment, such a list as would set all questions at rest.

When, therefore, the students of our Agricultural College continue, after graduation, as some do, the study of economic botany, entomology, or agricultural chemistry, or become the teachers of agricultural science in any of its numerous branches, it seems to me they are taking the surest course to realize the purpose of the Congressional grant. I do not, however, underrate the value to the student of manual skill and the College gives abundant opportunity for its attainment.

And I cannot close without a glance at the logic of our college course, in holding a range of study, somewhat wider than the specialist and the expert strictly require. The only true theory of education, especially the higher, is that which intelligently forecasting the duties and activeness of the future, shall give to the student a complete preparation for them all. And such a theory could not fail to embrace, not only the skill of the expert, but the duties of the parent, the citizen and the man.

The new education takes, so to speak, an inventory of all the elements that go to make up a large success in life, and wisely adjusts its course of study so as to furnish these elements in harmonious balance. A system of instruction, that while it claimed to be complete, should omit the knowledge which qualifies us to meet our obligations to our children and society, would be sadly dwarfed and defective.

This is a world where skill alone, can gather the rich ripe fruits of industry, and therefore the new education seeks to impart to the student the skill of the expert. But this is a world where knavery is constantly scheming to overreach the mere expert, and to rob him of his honest earnings. Therefore the new education seeks to arm the expert against knavery by giving him a knowledge of the laws of business. But this is a world further, where one class of workers combine against another, and conduct these operations with great shrewdness. Therefore the new education seeks to arm the student with the weapons of defense by imparting a knowledge of the laws of exchange.

It is, indeed, hard to conceive how helpless and hopeless the case of that man would be, who should gain great artistic accomplishments, or skill in handicrafts, without any practical wisdom in the duties springing out of the innumerable contacts of life. The architect, for instance, might attain such special capacity as to plan the noblest structure on earth, yet if his practical knowledge were limited to his art, his home might be desolate, his children go to ruin, his property the booty of the

sharper, and he himself might be victimized by relentless monopolies and oppressive laws without the ability to raise a finger in his own defense. It is clear in such case, that he must rely on others who possess the practical wisdom in which he himself is lacking. Our college courses of study arranged on the basis settled by congressional law, give the future farmer and mechanic, not only a full measure of artistic specialties, but with these a moderate amount of those studies whose tendency is to prepare men for the wider duties incumbent on all, and to raise the artisan in the social and intellectual scale. It is a serious question whether the farmer suffers more from the leaks of the farm, which spring from the absence of skill and economy in management, or from the monopolies that absorb the profits of farm products in their transportation and sale. Should not the man who is completely educated for industrial pursuits be armed against both?

Yet we are fully aware that there may be, on the farm and elsewhere, young men, who, while they desire to gain a greater efficiency in their vocations, cannot from lack of time or money take the wider course we have laid out. To provide for such cases the Trustees, as I have before said, at their meeting, November 15th, wisely adopted a shorter optional course composed of the specialties and handicrafts of the farm only, and requiring a year for its completion.

My subject is the relation of the Agricultural College to the organized enterprises for the promotion of industry and specially to this Society. That relation exists in the fact that, though differing widely in method, their purposes are kindred. The industrial departments of the College, the workshop, the farm, fine stock, garden, and nursery are primarily the apparatus for instruction. But this purpose can be fully answered only when their operation is perfect, and it is in its complete and successful working that the farm holds kinship with the State Agricultural Society, the stock department to the stock breeders, the workshop to the various branches of mechanic arts, the orchard garden, and nursery to the State Horticultural Society, and that this natural kinship may be knit with the fibers of sympathy more closely year by year until each, thus strengthened, may be enabled to do its perfect work is my earnest desire.

COURSES OF STUDY.

AGRICULTURAL COURSE.

FRESHMAN YEAR.

First Term.

Algebra.
 Book-keeping.
 Analysis of English Language.
 Rhetoric.
 Free-hand Drawing.
 Elocution : English Composition.
 German. (*Optional to proficients in Analysis*).

Second Term.

Geometry.
 Physiology.
 Elements of Criticism.
 Free-hand Drawing.
 Elocution : English Composition.
 German. (*Optional*).

SOPHOMORE YEAR.

First Term.

Plane Trigonometry and Surveying.
 General Chemistry.
 Botany.
 Physics.

Second Term.

Inorganic Chemistry : Qualitative Analysis.
 Botany.
 Zoology : Entomology.
 Agriculture : History, races, breeding and management of domestic animals.
 Physics.

JUNIOR YEAR.

First Term.

Landscape Gardening.
 Organic Chemistry, and Quantitative Analysis.
 Botany.
 Physics.
 Agriculture : propagation of plants, seedlings, grapes and fruits : orcharding : fruit culture : forestry.
 Elocution : Addresses in Chapel.

Second Term.

Agriculture : Farm engineering and architecture : draining : road-making : water supply : plans for farm buildings.
 Agricultural Chemistry : Analysis of Soils, etc.
 Comparative Anatomy and Physiology.
 Physics : Meteorology.
 Elocution : Reading of Shakspeare.

SENIOR YEAR.

First Term.

Psychology.
 Geology.
 Agricultural Chemistry.
 Agriculture: Preparation of soils, and
 Management of Crops.

Second Term.

Political Economy.
 Constitutional History and Law.
 Science of Language.
 Veterinary Science and Practice.
 Elocution: Addresses in Chapel.

COURSE IN HORTICULTURE AND FORESTRY.

FRESHMAN YEAR.

First Term.

Identical with the course in Agriculture.

Second Term.

Identical with the course in Agriculture.

SOPHOMORE YEAR.

First Term.

Identical with the course in Agriculture.

Second Term.

Inorganic Chemistry and Qualitative Analysis.
 Botany.
 oology: Entomology.
 Hot-bed Culture: Principles of fruit culture: grafting and budding: vineyard culture.
 Physics.

JUNIOR YEAR.

First Term.

Organic Chemistry and Quantitative Analysis.
 Botany.
 Physics.
 Landscape Gardening.
 Kitchen Gardening: general management: kinds of vegetables: methods of culture.
 Elocution: Addresses in Chapel.

Second Term.

Agricultural Chemistry, and Analysis of Soils.
 Farm Engineering: Draining: road making: water supply.
 Farm Machinery.
 Farm Architecture: Plans for farm houses, barns, sheds, dairies, etc.
 Comparative Anatomy and Physiology.
 Physics: Meteorology.
 Study of Shakspeare.

SENIOR YEAR.

First Term.

Psychology.
 Agricultural Chemistry.
 Geology and Mineralogy : Formation
 of soils.
 Flowers and Flowering Plants: Soils
 for different fruits.

Second Term.

Political Economy: Constitutional his-
 tory and law.
 Forestry.
 Market Gardening.
 Science of Language.
 Elocution : Addresses in Chapel.

COURSE IN STOCK-BREEDING.

For the Freshman, Sophomore, and Senior years, the course is identical with the Agricultural course.

JUNIOR YEAR.

First Term.

Quantitative Analysis.
 Vegetable Physiology.
 History of Different Breeds of Do-
 mestic Animals.
 Landscape Gardening.

Second Term.

To the studies of the Agricultural
 course, add the Treatment and
 Training of Domestic Animals.

Students in this course have special privileges and instruction in the care of Domestic Animals, treatment of their diseases, etc., and may be confined to this work if they so choose.

COURSE IN MECHANICAL ENGINEERING.

FRESHMAN YEAR.

Identical with the course in Agriculture.

SOPHOMORE YEAR.

First Term.

Identical with the course in Agriculture.

Second Term.

Analytical Geometry.
 Descriptive Geometry, *Church*.
 Inorganic Chemistry: Qualitative
 Analysis.
 Physics.

JUNIOR YEAR.

First Term.

Landscape Gardening.
 Differential and Integral Calculus,
Buckingham.
 Shades, Shadows and Perspective,
Church.
 Physics.
 X Organic Chemistry.
 Theoretical Mechanics, *Peck.*
 Addresses in Chapel.

Second Term.

Exercises in Mechanical Drawing,
Warren.
 Applied Mechanics: Strength of Ma-
 terials, *Wood.*
 Physics: Meteorology.
 French.

SENIOR YEAR.

First Term.

Psychology.
 Geology.
 Principles of Mechanics.
 Machine Drawing.
 French.

Second Term.

Political Economy.
 Constitutional History and Law.
 Theory of Motors, *Rankine.*
 Designs, Details, and Estimates for
 Machinery.
 Elocution: Addresses in Chapel.

COURSE IN CIVIL ENGINEERING.

For the Freshman, Sophomore, and Junior Years, the course is identical with the course in Mechanical Engineering.

SENIOR YEAR.

First term.

Psychology
 Geology.
 Civil Engineering: Materials and struc-
 tures.
 Field Practice: Surveys for railways
 and other works, with maps and
 plans in detail for their construc-
 tion.
 French.

Second Term.

Political Economy.
 Constitutional History and Law.
 Civil Engineering: Combined struc-
 tures.
 Designs and detailed drawings for
 Bridges and other Civil Construc-
 tions.
 Elocution: Addresses in Chapel.

COURSE IN MINING ENGINEERING.

For the Freshman, Sophomore, and Junior years, the course is identical with the course in Mechanical Engineering.

SENIOR YEAR.

First Term.

Psychology.
Geology.
Quantitative Analysis.
Metallurgy.
French.

Second Term.

Political Economy.
Constitutional History and Law.
Metallurgy.
Mine Surveying and Machinery.
Elocution: Addresses in Chapel.

COURSE IN ARCHITECTURE.

For the Freshman, Sophomore, and Junior years the course is identical with the course in Mechanical Engineering.

SENIOR YEAR.

First Term.

Psychology.
Geology.
Constructive Architecture: Carpentry and Masonry: Building Materials.
Designs for roof trusses, centres, etc.
Shop Practice: Carpentry and joinery.
French.

Second Term.

Political Economy.
Constitutional History and Law.
History and Principles of Architecture: Detailed study of the Orders.
Architectural Designs: Detailed drawings, estimates, and specifications.
Elocution: Addresses in Chapel.

COURSE IN GENERAL SCIENCE FOR LADIES.

For the Freshman year the course is identical with the course in Agriculture.

SOPHOMORE YEAR.

First Term.

General Chemistry.
Botany.
English Literature.
Physics.
Plane Trigonometry.

Second Term.

Inorganic Chemistry: Qualitative Analysis.
Botany.
Zoology: Entomology.
Physics.

JUNIOR YEAR.

First Term.

Landscape Gardening.
Organic Chemistry.
Botany.
Domestic Economy.
Physics.

Second Term.

Domestic Chemistry.
Comparative Anatomy and Physiology.
Physics : Meteorology.
French.
Elocution : Reading Shakspeare.

SENIOR YEAR.

First Term.

Psychology.
Geology.
Mineralogy.
French.

Second Term.

Political Economy.
Constitutional History and Law.
Science of Language.
Elocution : Addresses in Chapel.

NORMAL COURSE.

The course of lectures for the Normal Department includes the following subjects: Organization and government of Schools; Methods of Teaching; Primary Instruction; Natural order of studies corresponding to the order of evolution of the intellectual powers; Mental Philosophy as applied to the work of the school-room; Rigid review of the common branches.

The above course of lectures will be given during the last month of the College year.

NEW COURSE OF STUDY.

"The Congressional Law, while it requires that the course of study in the industrial schools established by the national bounty, shall meet the wants of the industrial classes, leaves the details of their courses to be settled by each State that accepts the national grant.

Our programme of study and practice has, seemingly, met the wishes of the public in both matter and method, and if a single young man in the State has been deterred from attending the Agricultural College by reason of the lack of any industrial specialty he desired to pursue, we have not been informed of the fact. To meet the possible demand, however, of a few, for exclusive instruction in the handicrafts of the farm, and the special branches that underlie them, it is recommended

that in addition to the courses now established, the Board adopt an optional course embracing the following studies, requiring one year for their completion.

[Of course the conditions of admission will be the same as for students of the other departments.]

First Term.

Farm Accounts.

General Chemistry.

Economic Botan

Management of crops: Propagation of plants, seedlings, grapes, and fruits: fruit culture: forestry.

Second Term.

Insects injurious to Vegetation.

Agricultural Chemistry: Analysis of Soils.

History, races, breeding, and management of domestic animals.

Farm Engineering and Architecture; Draining, road-making, water supply, fencing, farm machinery.

The above was adopted, and added to the other regular courses.

[Proceedings of the Board of Trustees, November, 1874.]

TIME TABLE.

FIRST TERM.

7-15-S	8---9	9---10	10-11	11-12	1-1-30	1:30-2:15	2:15-3	3-3-45	3-45-4:45	7-10
Practice in the Field.				Book-Keeping.		Language.	Algebra by divisions.	Algebra by divisions.	Elocution,† English Comp. Military Drill. F. H. Drawing.	Study.
	(Trig'try {Surv'ng		Botany *	Chemistry.* Physics.†	Practice in the field or Chemical Laboratory by divisions.					Study.
Organic Chemistry with Practice in the Laboratory.			Landsc. G.* Agricul'tre.†	Botany.		Physics †	Practice in the Field.			Study.
Organic Chemistry with Practice in the Laboratory.*			Landsc. G.* S.S. & Pers.†	Calculus.		Mechanics.	Practice in the Workshop.			Study.
Practice in the Field.			Geology.* Ag'l Ch'y.†	Psychology.		Mineral'gy.*		Agriculture.†		Study.
		Eng'ing.	Geology.* French.†	Psychology.	Practice in the Field, Workshop and Drawing Room.					Study.

SECOND TERM.

Practice in the Field.				Physiology.* Practical Farming.†		Language.	Geometry by divisions.	Elocution.† English Comp. Military Drill F. H. Drawing.	Study.
	Chem'try† Stock Bdg.*		Zoology.	Physics.* Botany.†	Practice in the Field or Chemical Laboratory by divisions.†				Study.
	Chem'try†		Anal. Geom	Physics.* Des. Geom.†	Practice in the Workshop or Chemical Laboratory by divisions.†				Study.
Laboratory Practice in Agricultural Chemistry.*			Sci. Lan'ge.	F.E.&Arel.* Ag'l Chem.†	Practice in the Field.				Study.
	Mechanics	Physics.†		French.	Practice in the Workshop and Drafting Room by divisions.				Study.
Practice in the Field.				Polit. Ec'y. Con'l H.&L.		Pathology.		Comp. Anat. & Physiology.	Study.
	Architecture.	Engineering.		Con'l H.&L.	Practice in the Drafting Room.				Study.

*Tri-weekly. On Mondays, Wednesdays and Fridays.

+Semi-weekly. On Tuesdays and Thursdays.

‡The Freshman class is divided into four divisions, A, B, C, D.

Whereof: On Monday A and B have Freehand Drawing, C Elocution, D English Composition,

On Tuesday A has Elocution, B English Composition, C and D Freehand Drawing.

On Wednesdays the whole class has Military Drill.

On Thursdays A and B have Freehand Drawing, C English Composition, D Elocution.

On Friday A has English Composition, B Elocution, C and D Freehand Drawing.

§The Sophomore class is so arranged that during the Spring Term each student spends two afternoons per week in the Chemical Laboratory, two afternoons per week in the labors of the Farm, Garden, &c., and one afternoon per week in the field Surveying, throughout the term.

¶The Sophomore class is so arranged during the Fall Term that each student spends three afternoons per week in the Chemical Laboratory, and two afternoons per week in the labors of the farm or workshop.

|| The Constitutional History and Law occupy the first half, and the Political Economy the last half of the term.

In place of Surveying, the ladies have English Literature at the same hour.

Other special studies in the Ladies course will have the time for their recitation arranged when the classes are formed.

The hours for lessons and practice in music are arranged privately by the teacher with each pupil.

DEPARTMENTS OF INSTRUCTION.

AGRICULTURE.

The aim of this department is to add skill in the various actual operations of the farm, to a complete understanding of those operations, and a thorough knowledge of the principles which underlie them.

The preliminary studies are pursued in the departments of Mathematics, Chemistry, Botany, Zoology and Physiology, and upon the perfect mastery of these, depends largely the student's success in the later and more comprehensive study of Agriculture.

The theoretical study of Agriculture proper, occupies two years and is divided at present between President Welch and Professors Stalker, McAfee and Bessey.

Instruction in Agricultural chemistry and analysis of soils, is given by the Professor of Chemistry during the Junior and Senior years. Instruction in the management of the domestic animals, rotation of crops, use of manures, raising of crops etc., is given by Professor Stalker. Lectures on the formation of soils and kindred topics, are given by the Professor of Geology.

SOPHOMORE YEAR.

The history, races, breeding and management of domestic animals. President Welch lectures upon cattle during the second term, and Superintendent Stalker upon horses and swine.

JUNIOR YEAR.

First Term.—Propagation of plants, seedlings, grapes, and fruits, orcharding, fruit culture and forestry.

Professor McAfee gives lectures upon all these topics.

Second Term.—Farm engineering and architecture, embracing drawing, Road-making, Water supply, Farm machinery, plans for farm houses etc. Weekly practice is given the class in Surveying and Leveling.

SENIOR YEAR.

First Term.—Preparation of soils, and management of crops.

Professor Stalker gives two lectures per week throughout the term, giving special attention to the varieties of soil in our own State, their peculiar treatment, the particular crops adapted thereto, their culture and their values.

The above lectures are given either in class-room, field or stable as the subject deserves. The practical operations in agriculture are fully illustrated in the management of the large farm attached to the College upon which a course of mixed husbandry is pursued under the immediate superintendence of Professor Stalker. Students have opportunity to witness all these operations when not otherwise employed, and by the statute establishing the College, they are required to spend some two or three hours each day at manual labor. This labor is for the most part upon the farm, under proper instruction, and if the students desire, it may be entirely so. In addition, the orchards, nurseries, vineyards and small fruit gardens are under the immediate charge of Professor McAfee. This gentleman employs students to do the work in his department and trains them in all the operations connected therewith. The College Farm has great variety of soil, necessitating a varied culture. For its cultivation it has all the more approved farm machinery, and for the purpose of illustration it is stocked with many of the more important breeds of cattle, sheep, swine and fowls. The Professor of Agriculture has projected a series of experiments which will be conducted with great accuracy, and result in the establishment of facts upon which the science of Agriculture may be built.

HORTICULTURE AND FORESTRY.

This department, distinctively established at the beginning of the year 1874, embraces the instruction and practice in culinary horticulture, floriculture, pomology, and forestry, and comprises class-room exercises and field lectures in the presence of the objects to be studied, together with daily practice in all the manipulations of the work of the gardens, nurseries, orchards, forestry plantations, flower borders, hedges and ornamental grounds.

The instruction is imparted principally by lectures, as no text books entirely suited to the wants of such a department are yet published. The topics of instruction are considered in the following order: First,

general horticulture, embracing physics of the soil, plant development and nutrition, and external influences upon plants; second, technical horticulture, embracing descriptions and studies of implements, processes, and plants and their products.

The teaching is supplemented, so far as may be, by practice on all the operations and details of the work which is always in progress while the College is in session; and principles and facts are fixed in the mind by the use of visible objects of study always accessible to the student.

The means of practical illustration at the command of the department are as follows:

The vegetable gardens planted in all descriptions of culinary crops.

The nurseries, planted with such stock as will best illustrate our work.

The orchards, planted with seventy varieties of apples, fourteen varieties of pears, five varieties of cherries, and three varieties of plums.

The small fruit plantations, planted with the hardiest and best varieties of grapes, raspberries, currants, strawberries, etc.

The forestry plantations, planted with such trees as are best adapted to climate and location.

The ornamental grounds, planted with one hundred and fifteen varieties of trees and shrubs.

The flower gardens, upon which a large variety of hardy flowering shrubs and plants are grown.

In addition, collections are in hand, or being made, as follows:

A set of *fac-simile* casts of the fruits of Iowa, native and introduced.

A set of the native woods of Iowa, with their leaves and fruits.

A set of sections of the cultivated woods of Iowa, to show rate of growth under culture.

A set of insects injurious to objects of culture in this department.

A set of insects and animals beneficial in horticulture, by being predatory upon destructive insects.

A set of abnormal and of diseased growths.

CHEMISTRY.

SOPHOMORE YEAR.

First term. General Inorganic Chemistry. Recitation three times and Laboratory practice twice each week. The topics discussed in the text books, and lectures, are illustrated by experiments in the Laboratory, which the student is required to perform.

Second Term. General Inorganic Chemistry and qualitative Analysis. The recitations comprise a careful review of the previous term's work. The laboratory practice (three afternoons in the week) embraces a thorough course in qualitative Analysis. Both the simple and complex substances, which the student is systematically taught to analyze, well fit him for future usefulness in this important branch of the science.

JUNIOR YEAR.

First term. Organic Chemistry. Recitations and lectures three times a week. Laboratory practice daily. The series of experiments, which every student is required to perform, is chosen with special reference to their practical utility. Such topics as photography, color-dyeing, toxicology, etc., are taught by lectures, and these, with the text book (Miller's), and experimental work, familiarize the student with the important subjects of chemistry.

Second term. Quantitative Analysis; Physiological and Agricultural Chemistry. These are taught twice each week. Quantitative Analysis is taught by lectures and laboratory practice. With good facilities the student is enabled to analyze coal, water, soils, manures, fertilizers, etc. Physiological Chemistry is taught solely by lectures and experiments in the laboratory. Such studies as those of foods, (including the fat and muscle producers in stock,) animal nutrition, adulteration of articles of diet; the milk of the various breeds of cows, with a view to dairy profit, etc., engage the pupil's closest attention in the lecture room and at the laboratory table. The *ladies' course* includes the study of Domestic Chemistry, taught once a week during the term, by lecture, affording instruction on such subjects as the cooking and preserving of meats, ventilation, bread-making, canning of fruits and vegetables, soap-making, diet of the sick room, etc.

FACILITIES.

Through the appropriation made by the last Legislature, the facilities for the thorough prosecution of this study have been very greatly increased. For an earnest student—one desirous of obtaining a practical and available knowledge of chemistry—this College certainly affords superior advantages. The laboratory is well supplied with the advances of recent years, giving to each student the benefits of a table, gas, water, and chemical apparatus for his exclusive use. There are

one hundred of these tables, at which all the experiments of agricultural, organic and inorganic chemistry may be performed. Twenty of these are in a separate room, where, with superior balances and excellent dissecting apparatus, the pupil may prosecute the study of quantitative analysis in quiet and retirement. The fittings of the laboratory are very good. The sand-baths, hoods, dispensing room, heating and ventilating appliances—so necessary to a complete laboratory—are here. During the past year, in all the branches of chemistry, most interesting experiments have been performed. It has been the aim to select for the student such work as might be useful to him in the everyday life of his future. While the facilities are good, some improvements are yet necessary. Among the most important may be mentioned the renovation of the chemistry recitation room. Situated as it is in the basement of the old laboratory—very much confined, dark, and damp—an expenditure of at least one hundred and fifty dollars is needed to make it simply comfortable and useful. It is hoped that this will be attended to early. Another matter of importance is an appropriation of at least two hundred and fifty dollars for the purchase of such apparatus as may be needed for the manufacture of many of the chemicals used. If such purchase be made, at least three hundred and fifty dollars can be saved to the department annually. A small appropriation—fifty dollars, perhaps—should be made for repairs and improvements absolutely necessary in the “old laboratory.” These three suggestions are made irrespective of the usual amount needed for the carrying on of the year’s study and work. As will be seen by reference to the cashier’s accounts, not nearly the amount appropriated to this department last year has been expended, although repairs, etc., have been paid for from this sum. Altogether, the year has been a successful one. Over one hundred and twenty-five students have pursued their studies in chemistry, and have uniformly evinced close attention, and a keen interest. The practical fruits of such study must undoubtedly be seen and felt by the community in which these young men and women are thrown.

During the past term two students of the Junior Class in Organic Chemistry have prepared about forty specimens for the Centennial Exposition. They are chemicals in daily use, such as vegetable acids, dyes, inks, ethers, alcohol, etc., and are very pure and good. They afford a good illustration of industrial education; of practical chemistry as taught in this College.

BOTANY.

The classes in Botany have, during the past two years, been unusually large, overcrowding the lecture-room throughout both college terms. The work done by the students has year by year shown a marked and satisfactory improvement, both as to quality and quantity, due to the increased facilities furnished by the department. Each member of the Sophomore Class of all the courses, is required to study Elementary Botany for half a year, and during this time, besides reciting from "Gray's Lessons," he makes careful and minute analysis of at least twenty plants, recording his observations, and submitting them to the professor for examination. He also collects, prepares, mounts and classifies fifty herbarium specimens, which are submitted at the end of the term for examination and correction.

In the second term, those who continue the subject, devote three-fourths of the allotted time to laboratory work, which consists in the dissection and examination of grasses and some of the other difficult orders of plants. The leaf-forms of our native and cultivated trees are studied, and the distinctions between species are accurately pointed out. The student prepares fifty additional herbarium specimens in the same manner as in the first term. Seven of the finest of these sets of plants this year were selected, and will be exhibited at the Centennial Exposition.

In the Junior year, the deeper questions in vegetable anatomy and physiology are discussed and investigated, and in this the student is encouraged to make as many examinations as possible by means of the microscope. The groups of plants which furnish products of economic value, and the origin and modifications of cultivated plants are noticed and discussed in the lecture-room. The lower orders of plants receive the student's attention for a few weeks near the close of the term. Particular attention is given to the parasitic fungi, and remedies and means for preventing their ravages are carefully examined.

The means for illustration are: (1.) The College Herbarium; (2.) A collection of billets of various kinds of woods; (3.) A collection of grasses; (4.) A collection of cones of evergreens; (5.) A set of diagrams and charts; (6.) Students also have access to the collections of mosses, lichens and fungi, belonging to the professor in charge.

Considerable additions have been made during the past year to the collections in this department. A part of these are now east for classification, and upon their return they will be added to the College herbarium, and thus be made available for study and comparison.

A collection of Sierra Nevada woods, purchased during the year, will be placed with the other collections for early use next year.

Arrangements have recently been completed for securing a large collection of Central and Southern European specimens for the Herbarium, a part of which will be ready for study the coming year.

ZOOLOGY.

The course of instruction in general Zoology occupies a portion of the last term of the Sophomore year. During the past two years the classes have contained above forty students apiece, and in nearly all cases good progress has been made. The method of instruction is a combination of the recitation system with lectures and museum study. Lessons from a text book are assigned daily, and these the students are required to carefully prepare and recite; lectures are given from time to time upon the more important topics which are not sufficiently dwelt upon in the text book; and throughout the whole course the student spends a portion of his time in the study of the specimens in the museum.

The College possesses in this department, (1) a fine collection of the birds of Iowa; (2), a collection of serpents; (3), a few mammals mounted, and a considerable number of skins unmounted; (4), various small sets of shells, nests, eggs, etc., etc.

During the past year the College obtained by purchase a set of shells from California and the Pacific Ocean, comprising about one hundred and seventy-five species, many of which are rare, and of great interest to the scientific student. This collection will be placed upon the shelves of the museum during the first term of the next year.

This department has been assigned by the Government at Washington, D. C., a fine collection of marine animals, gathered under the supervision of Professor Baird, of the Smithsonian Institution. These specimens will be sent to the College in the early part of the coming year, and when arranged in the museum will add very considerably to the present facilities for instruction.

ECONOMIC ENTOMOLOGY.

During eight weeks of the last term of the Sophomore year, Entomology takes the place of General Zoology. After obtaining from the text book a general knowledge of the construction and classification of insects, the students attend a course of lectures, in which all the more

prominently harmful insects are taken up and discussed. In each case the life-history of the insect is dwelt upon, as of the greatest importance in enabling the farmer or gardener to suggest remedies; the various checks and remedies are taken up and discussed, and the student is invited to freely give his opinion as to their value and practicability.

The College possesses a valuable cabinet of insects, which is accessible to the students of this department. To this collection large additions were made during the past two years, and the work of classifying and fully arranging it has made considerable progress.

From this department there have been sent out from time to time, through the public press, notices of some of the more injurious insects affecting the plants and animals of Iowa, and it is hoped that by these means a considerable amount of valuable information has been received by the people of the State.

COMPARATIVE ANATOMY AND PHYSIOLOGY.

The course in this branch of Natural History extends through the last term of the Junior year, and is designed to familiarize the student with the general anatomy, physiology and development of all the great groups of animals. The method of instruction is by means of daily lectures, supplemented by an examination of books of reference. One day each week is set apart for the dissection of specimens, and the student is encouraged to make as many examinations of both living and dead animals as is practicable. Particular attention is given to the general anatomy of our domestic animals, including the horse, ox, sheep, hog and dog, furnishing as they do readily obtainable subjects for study, besides being of interest from other points of view. Thus, while it has a broader scope and a much more general application, this study is a very fitting introduction to Veterinary Anatomy, and in fact the student by his general knowledge of Comparative Anatomy, will have no difficulty in readily understanding the details of structure in the few closely related species of domestic animals, which are the subjects of the veterinarian's study.

GEOLOGY.

This study is pursued by the Senior class during the first term. The subject of Mineralogy is first studied by means of lectures and specimens from the Museum. Dana's text-book of Geology is then com-

pleted, and afterwards, the class spends from two to three weeks studying the Geology of Iowa. A course of lectures is then given upon Geology as related to Astronomy, and on various other important subjects, such as : Iowa coal mines, petroleum, salt and gypsum, origin of the prairie, and kindred subjects. As aids to the study, the Museum is furnished with a full series of Ward's geological casts, giving examples of the fossils peculiar to every stage of the world's history. The Museum also has a valuable collection of the more important minerals and rocks, and additions are being made thereto every year. Occasional excursions are made by this class, accompanied by the teacher, to places in the vicinity which will afford the best opportunity for the study of practical Geology.

DOMESTIC ECONOMY.

Domestic Economy is taught to the young ladies of the Junior Class, by lectures on the following topics: House furnishing, ventilation, water supply, cooking, sewing, management of help, care of the sick, training of children, dress, etc.

MATHEMATICS.

There are two courses in Mathematics, a Lower and a Higher. The lower course embraces:

Freshman Year.—Algebra and Geometry.—Loomis.

Sophomore Year. { Trigonometry.—Loomis.
Surveying.—Gillespie.

The Higher course embraces:

Sophomore Year. { Analytical Geometry.—Church.
Descriptive Geometry.—Church.

Junior Year. { Differential and Integral Calculus.—Church.
Descriptive Geometry, Shades, Shadows, and
Perspective.—Church.

The Lower course is designed for all the students, and the Higher course especially for those who pursue the studies in Mechanical or Civil Engineering.

Instruction is given mainly by text-books, daily recitation, and lectures. The subject is illustrated, and the theory applied, by the construction and solution of numerous problems. Students in Surveying are required to practice daily, by divisions, in the field during the latter part of the spring term. They use the instruments, keep the notes,

plat the surveys, and obtain a thorough knowledge of all practical operations.

BOOK-KEEPING.

The instruction in book-keeping is given in connection with the lessons and exercises in Bryant & Stratton's larger text-book. Each student opens and keeps a full set of books in double entry; writes business letters, contracts, receipts, bank checks, accounts of sales, bills of lading, and other business and legal papers; rules, and keeps the various auxiliary books useful in business; files and preserves vouchers, and in general, does what he would be called upon to do in actual business. In addition, tri-weekly recitations are made upon the principles involved and their applications.

CIVIL ENGINEERING.

For the first three years the studies of this course are identical with those of the course in Mechanical Engineering.

The studies of the Senior year embrace topography, geodesy, leveling, all operations connected with Field Engineering, such as location and construction of roads, canals, etc., building materials of various kinds, their properties, preparation, and uses under different circumstances, erection of various kinds of engineering structures, theory of structures, stereotomy, shading, tinting, topographical and structural drawing.

It has been the aim to make the instruction as thorough and as practical as possible, to combine theory and practice, and for these purposes five afternoons each week during the year are devoted to practice in field, workshop, and drawing room. Three afternoons each week during the first term and two during the second are devoted to practice in the workshop, making the student skillful in the use of tools, and familiar with the different machines for working wood and iron. Two afternoons each week during a portion of each term are spent in the field, making various kinds of engineering surveys, and the remaining afternoons in the drawing room making calculations of excavation and embankment, estimates, profiles, plans, and finished drawings of engineering works.

Instruction is given mainly by text-books, being as few in number as is consistent with the object in view, and on subjects for which no text-book is suitable or available, lectures are given.

PHYSICS.

The facilities for giving instruction in Natural Philosophy are now excellent. Commodious apartments are furnished in the new laboratory, including a lecture room, room for the physical cabinet and a meteorological observatory, besides other rooms which can be applied to special uses, when needed. The lecture room is large enough to accommodate one hundred and fifty students, and is seated in such a manner as to afford the best opportunity for performing class experiments. This room is also well supplied with water, gas and other conveniences needed for experimenting. The room set apart for the physical cabinet is supplied with water, gas, experiment tables, and other facilities needed for original investigation and private work. It is intended that students who desire to pursue a higher course in experimental physics shall use this room for that purpose.

Physical Cabinet.—Additions are made every year to the collection of physical apparatus, and since care is taken to purchase none but that of good quality and the best workmanship, the cabinet is becoming an interesting feature of the College. Among other important instruments may be mentioned: An Atwood's Machine, with automatic movement, for studying the laws of falling bodies; one of Ritchie's best air pumps, costing two hundred and seventy-five dollars; a large Holtz electrical machine with Geissler tubes and other apparatus for experiments with electricity; Melloni's and Professor Tyndall's apparatuses for the study of heat; a large Ruhmkorf coil; a set of large mirrors with lenses, prisms, pictures, etc., imported from France; an excellent stereopticon with several hundred pictures, besides numerous smaller pieces for use in mechanics, pneumatics, magnetism and sound. During the last year a Bradley's galvanometer with three coils has been added, and also some standard apparatus for the study of Polarized light and Double Refraction. The value of the apparatus amounts to more than four thousand and two hundred dollars.

Course of Study.—The study of Physics, as now arranged, commences with the first term of the Sophomore year and ends with the second term of the Junior year. During the first term the the Sophomores study the subject of the mechanics of solids, liquids and gases. Especial attention is given to the theory of pumps and those subjects which are of most practical use. During the second term they complete the subjects of heat and sound. The Junior class during the first term studies optics, and during the second term completes the subjects of elec-

tricity, magnetism and meteorology. Throughout the entire course the subjects under consideration are illustrated by numerous valuable and attractive experiments. The excellent physical cabinet makes this feature of the study particularly interesting. As a text-book for general use, the sixth edition of Atkinson's Ganot has been found superior to any other work designed for a higher course. But the course of instruction is not confined to any text-book. An elementary course of lectures on the mechanics of solids is given to the beginning classes. After completing the text-book the Junior class has a course of lectures on the conservation of energy; correlation of the physical forces; physical theory of machines; perpetual motion; potential energy; and on the correlation of physical with vital forces, and the dissipation of energy.

Meteorology.—This branch has been placed in charge of the Department of Physics. An opportunity is afforded students to study practical Meteorology. The equipment for taking daily observations is as follows: Barometer, psychrometer, standard thermometers, wind vane, rain gauge, maximum and minimum thermometers. Observations are taken upon all these instruments daily, and also on the force of the wind and amount of cloudiness. Monthly reports are sent to the chief signal officer at Washington, and in return are received and filed all the daily, weekly, monthly and yearly reports from that office. Carefully prepared charts are made each month, in which the movements of the barometer, thermometer, wind, etc., are represented by curves. Additions and improvements will be made every year to this department.

ENGLISH LANGUAGE AND LITERATURE.

FRESHMAN YEAR.—ALL COURSES.

First Term.—Analysis of the English Sentence (Welch's), and Rhetoric.

Second Term.—Elements of Criticism.—(Kames').

SOPHOMORE YEAR.—LADIES' COURSE.

This year embraces the course in English Literature, proper.

First Term.—English Literature, embracing the early history of the English Language, and a critical study of the biography, literary labors, style, &c., of the representative authors of the marked epochs of

English History; special stress being laid on the political and religious influences at work in the times in which they wrote.

SENIOR YEAR.—COURSE FOR THE AGRICULTURISTS AND LADIES.

Second Term.—Science of Language. Prof. W. D. Whitney's work, entitled, "Language and the study of Language," is the text-book used. In this study the student is made familiar with the underlying principles of linguistic growth and decay, and the processes of phonetic change, the genetic and morphological classifications of all the great families of tongues on the face of the earth, and the conclusions reached by the great masters in comparative philology on the origin of language, its relation to thought, and its bearing on the question of the unity of the human race.

Two plays of Shakspeare are critically studied with the view more particularly of fixing the import of the "Shakspearian phraseology," and exercising the students' powers on obscure and highly wrought passages. These plays are afterwards made the material for elocutionary drill.

FRENCH.

French is studied during one year of the Course by the ladies, and by the gentlemen in the mechanical course. Fasquelle's "French Course" is studied thoroughly, and then one term is almost entirely occupied in making translations from Knapp's French Reader.

PSYCHOLOGY.

The study of psychology occupies one hour daily through the first term of the senior year. It is pursued first by text book recitations, afterwards by listening to familiar lectures, and finally by the preparation and reading of essays on the most important topics which the science presents. The purpose sought in the study is not to acquire the habit of idly speculating on questions which lie beyond the limits of human knowledge, but rather to gain a thorough insight into human nature, and the springs of human conduct. All intercourse with men calls such knowledge into exercise.

POLITICAL ECONOMY.

Political economy is the science of exchange. It presents and expounds the laws of business in all their complexity. Industrial education, especially at the present day, is incomplete without a familiarity

with the principles that underlie the commercial transactions whether small or great. In nearly all the vocations, a lack of such knowledge is almost a fatal deficiency. Political economy is studied during the senior term, by means of recitations, discussions and essays.

COMPOSITION.

The Freshman Class give during the entire year, one hour a week to careful drill, in the class room, in English composition; essays and written discussions are prepared and brought to class where they are criticised and corrected.

ELOCUTION.

The Freshmen have regular drill in Elocution once a week during the whole year. Orations are prepared in the class in composition and then are practiced upon and spoken in the elocution class.

MUSIC.

Music is not, by law, a regular study in the College curriculum. Opportunities are given, however, to such as desire it, to take lessons upon the organ or piano, and also in vocal culture. The rates of charge are as follows :

Lessons on piano, (one each week)\$10 per term.

Lessons in vocal culture, (two each week) 12 per term.

Lessons on organ, (one each week) with practice every
day..... 10 per term.

Students pay for tuning instruments twenty-five cents per month.

Sheet music extra.

MILITARY TACTICS AND ENGINEERING.

This department established pursuant to act of Congress, will be sustained in strict conformity with United States Army Regulations, the course embodying the following branches of study :

Military Engineering.—Field and Permanent Fortifications : military bridges ; mining ; topographical, and free hand drawing.

Military Tactics.—Infantry, cavalry, artillery, bayonet and broadsword exercise.

Gunnery and Ordnance.—Theory of Projectiles, Siege, Artillery and Mortar practice.

Military Law.—Practice of Courts-Martial ; United States Army Regulations.

Practical instruction will be given in some one of the different arms of the service three times a week.

The following branches will be taught through the successive Collegiate years :

Freshman.—Schools of the Soldier and Company.

Sophomore.—Practical instruction in the schools of the Soldier and Company ; Field Artillery, Bayonet and Sword exercise.

Junior.—Schools of the Soldier and Company ; Bayonet and Sword exercise.

Senior.—Military Engineering ; School of the Battalion ; Ordnance and Gunnery ; Cavalry Tactics ; Military Law.

Text Books.—The text books used are Upton's Infantry Tactics, McClellan's Bayonet Exercise, Mahan's Military Engineering, Smith's Field Artillery. Works of reference are the following : Scott's Military Dictionary, Duparco's Military Art and United States Army Regulations.

Recitations and Drill.—Each class will recite or drill at least once a week in the following order viz :

Freshmen, Wednesdays from 3:45 to 4:45 P. M.

Sophomores, Tuesdays from 10 to 11 A. M.

Juniors, Thursdays from 9 to 10 A. M.

Seniors, Mondays, from 9 to 10 A. M.

The above classes will be organized into a College Battalion, the officers for the same being appointed in the following manner: Staff and Field officers from the junior and senior classes, and all others from the freshman and sophomore classes according to merit. The names of such as may be deemed eligible by the commandant of the Battalion and President of the College, will be forwarded through the Adjutant General's office to the Governor of the State for commission.

By the late action of the Board of Trustees of the College, all students taking the military course must be uniformed. It will therefore be necessary that those who intend entering the course in the spring of 1876, be furnished with uniform this winter. The uniform required will be, one regulation hat ; one blue blouse ; one pair blue pants.

The whole cost will not exceed \$20.00. The material will be of good quality, and suitable for ordinary wear on the College Farm.

Send measurement and the money to Gen. Geddes, Deputy Treasurer, as soon as possible.

THE MUSEUM.

The College has a valuable and growing museum. Rooms have been especially provided for the purpose, in the main College building. The departments of Geology, Zoology, Entomology and Anatomy, are well provided for by well preserved specimens for illustration. Among the prominent and interesting features of the museum may be mentioned a full set of the Ward series of Geological casts. These casts are restored forms of extinct animals. They are said by prominent naturalists, to be superior for purposes of illustration, to the original specimens from which they were copied, and represent the principal extinct animals which have existed from the earliest times to the present day. A valuable and well preserved set of Iowa serpents has been collected. A set of the birds of the State; woods, shells, the more important minerals and rocks, fossils, seeds, specimens of the plants of the West, mammals, etc., are other interesting features of the museum.

THE NEW LABORATORY.

The General Assembly at its last session, appropriated twenty-five thousand dollars for the erection of a physical laboratory. This building is now completed and occupied. In size it is seventy feet long, by forty in breadth, and three stories and a half high, including the basement. This building, together with the old laboratory which joins it, affords commodious apartments for the purpose for which it was designed. The basement of the new portion contains a boiler for heating the entire building, and valuable machinery for working in iron; power being transmitted from the work-shop by means of an endless wire rope. The old laboratory and the first floor of the new, are occupied solely by the department of Chemistry. The rooms are furnished with tables, gas, water, and all conveniences needed in a first class chemical laboratory. The second floor is occupied by the department of Physics. An excellent lecture room, well furnished, occupies the south half of the floor, and rooms for the physical cabinet and private work the remainder. The upper floor is lighted by skylights from the roof, and furnishes an excellent drawing-room for the Mechanical department, and a room to be used as an observatory.

These conveniences furnish the departments of Physics and Chemistry with very superior facilities for giving instruction to advanced students. Opportunity is offered for the student to study in the best possible way, by actually performing the experiments for himself. Both Physics and Chemistry can be taught to as good advantage as in any of the Eastern Universities.

A good experiment, either in Physics or Chemistry, is never forgotten. The student who actually handles the apparatus and performs the experiments in chemistry for himself gets therefrom a knowledge which cannot be obtained from books. The beautiful lecture-room experiments upon light, heat and electricity appeal to the senses as well as to the intellectual faculties and awaken an interest in study which can be stirred in no other way. The new education teaches the hand as well as the head. It teaches things and not books. The Agricultural College is in full sympathy with the new education, and opens wide the doors of its new laboratory for the use of all lovers of science with practice.

LIBRARY.

Early in the history of the College an appropriation of several thousand dollars was made for the commencement of a library. Every year an addition of several hundred volumes is made to the original nucleus, so that the whole number of volumes is now about five thousand. The library is designed to be a working one. The books purchased are such as will most effectively aid the teachers and students in the special work of the different departments of the College. Full sets of the most prominent encyclopedias have been purchased; such as the *Encyclopedia Britannica*, the *American* and *Chambers'*, besides numerous cyclopedias of dates and biography. The library is divided into alcoves and well arranged and fitted with tables, shelving, etc. In one alcove may be found the works of the modern standard poets, historians and writers of fiction; such as Scott, Macaulay, Dickens and Froude. Another alcove contains the standard works upon Physics, Metaphysics, Geology and of the British Essayists. On a little further may be found the *American Journals of Science* for the past thirty years; the prominent works on Agriculture, Horticulture and Applied Science.

The naturalist can find the works of Audubon, with beautiful plates of the birds and quadrupeds of America painted to nature. The library

is in receipt constantly of many of the prominent daily and weekly newspapers of the State, and also of many of the monthly magazines and periodicals of the United States and Europe. It is open eight hours each day for the use of students and teachers.

DONATIONS.

DONATIONS TO THE MUSEUM.

Swallow tailed hawk (mounted)	Mr. Chaney, Ames.
Specimens of calcareous tufa, from Clinton county.	Miss Crew, Clinton.
Fossils from Muscatine county.	W. W. Watters, Atalissa.
Rare Bat, from Western Iowa.	B. F. Crow, student.
Specimens of serpents, several species.	B. E. Canavan, student.
Eggs and nests, from Benton county.	Mr. Cobbey, student.
Fragments of wood from drift, 60 feet below the surface.	Dr. Starr, Ames.
A small set of shells from S. Carolina. .	Miss Julia Stalker, Sigourney.
Horned toad, from Texas.	H. H. McAfee.
Eggs and nest of prairie chickens.	Mr. Cobbey, student.
Specimen turtle.	Mr. George, student.
Specimens of cotton, from Louisiana.	Mrs. Beaumont.
Plants from Western Iowa.	B. F. Crow, student.
One lot specimens for herbarium.	E. W. Holway, Decorah.
One lot minerals.	J. K. Macomber.
One lot minerals, from Fort Dodge.	C. E. Bessey.
One lot minerals, from Rocky Mountains	————
Twenty-five specimens fossil woods, from Rocky Mountains.	————
Specimens of serpents, gophers, insects, etc	Many students.
One set fossils, from Illinois.	Hon. C. C. Carpenter.
One enormous puff ball, 43 in. in circumference.	M. C. Litter, student.
Skin of penguin.	Mrs. Welch.
One Scorpion, from Texas.	A. A. Parsons, student.
One lot African and other plants.	Miss Kellogg, Woodbine.
One specimen hawk.	Miss Winnie Dudley.
One lot plants, from Western Iowa. .	Rev. Robert Burgess, Woodbine.

1875.

Specimen of ash tree, gnawed by beavers, from

Muscatine county.	C. C. McIntire, student.
Specimen petrified wood.	Miss Fish, student.

Skins of red squirrels from Chickasaw Co.....Mr. George, student.
 Skin of screech owl from Chickasaw Co.....Mr. George, student.
 Skin of cormorant, from Western Iowa.....Mr. Pughtley, Woodbine.
 Fossil ammonite (?) from Muscatine Co ... W. W. Watters, Atalissa.
 Eighteen species Louisiana woods...Robert Beaumont, Akenhead, La.
 Nests and eggs of various birds.....Many students.
 Silicified wood, from California.....S. G. Isaman, You Bet, Cal.
 Specimens of coral.....Mr. Beadle, Cresco.
 Three lots of plants for herbarium.....Rev. R. Burgess, Woodbine.
 Specimen of natural glass.....Miss Angie Beard, student.
 Eighty specimens of eggs.....Hill Bros., Benson Grove, Iowa.
 Specimens rare eggs.....J. P. Plattenberger, Colorado.
 One insect destroyer.....Mr. McRisick, Spring Hill.
 Specimen rare serpent.....H. E. Frost, Ames.
 Fossil bones from the drift in Western Iowa.....J. C. Hainer, student.
 Several lots specimens for herbarium.....J. C. Arthur, Charles City.
 Several hundred Nebraska plants.....J. E. Grant, Neb.
 Specimen rare grasshopper.....P. L. Porter, Ames.
 Specimen of petrified lignite, Black Hills.....C. E. Whiting.
 Fossils from coal measures.....J. Slocum, Dallas Center.
 Devonian fossils.....H. R. Patrick, student.
 Specimens of minerals.....H. H. McAfee.
 Signal Service Reports, daily, weekly, monthly, and yearly; War Dept

DONATIONS TO DEPARTMENT OF HORTICULTURE AND FORESTRY.

A set of cions of new fruits, Philadelphia raspberry plants
 and pear tree.....D. B. Wier, Lacon, Ill.
 An offset on bill of grape vines.....D. B. Weir, Lacon, Ill.
 A set of cions of choice new fruits.....Mr. Piper, Palo, Ill.
 A set of cions of choice fruit, and number of cherry trees,
 D. W. Levett, Galena, Ill.
 A set of cuttings of new species of cottonwood.....Greeley, Col.
 A set of vegetable and flower seeds.....Geo. Haskell, Rockford, Ill.
 An offset upon bill of seeds.....J. B. Root, Rockford, Ill.
 An offset upon bill of seeds....Moore & Hylicher, Marshalltown, Iowa.
 An offset upon bill of seeds.....B. K. Bliss & Sons, New York.
 A set of seeds.....B. M. Watson, Plymouth, Mass.
 Cuttings of new species of willow . H. C. Raymond, Council Bluffs, Ia.
 A lot of new potatoes and beans.....A. M. Jones, Leroy, N. Y.

An offset upon bill of seeds.....	Briggs Bros., Rochester, N. Y.
A set of vegetable seeds.....	Dep. of Agriculture, Washington, D. C.
A set of vegetable seeds.....	Dep. of Agriculture, Washington, D. C.
Rocky Mountain evergreen seeds.....	C. C. Parry, Davenport, Iowa.
Specimens of new fruit.....	E. R. Heirg, Nora Springs, Ia.
Specimens of new fruit.....	Marshall Talbot, Polk City, Ia.
Specimens of new fruit.....	Mr. Cunningham, Lyons, Ia.
A package of evergreen trees.....	A. R. Whitney, Franklin Grove, Ill.
A package of evergreen trees.....	E. Ordway, Freeport, Ill.
Specimen fruit plates.....	Amana Society, Homestead, Ia.
Specimens of new fruits.....	A. Branson, Cedar county, Ia.
Specimens of new fruits.....	W. R. Smith, Sioux City, Ia.
Specimens of new fruits and wood.....	D. Patterson, Belle Plaine, Ia.
Botanical and wood specimens.....	Rev. R. Bourgress, Woodbine, Ia.
Specimens of new apples.....	Mrs. Smith, Keokuk, Ia.

DONATIONS TO FARM.

Several packages of seeds.....	U. S. Ag'l Department.
One Spanish Merino ram.....	A. Tracy, Spillville, Ia.

The following papers and other publications were sent to the Library by their respective publishers free of charge :

Iowa Weekly State Register.

Dubuque Daily Times.

Muscatine Weekly Journal.

Marshall Republican.

Ottumwa Weekly Courier.

Vinton Eagle.

Ames Intelligencer.

The Weekly Enterprise.

The Christian Register.

Colorado Mountaineer.

The Hancock Signal.

Nevada Representative.

Howard County Times.

Country Gentleman.

Live Stock Journal.

The Housekeeper.

Scientific Farmer.

Galena Commercial Advertiser.

The Common School.

New England Journal of Education.

The Western.

Unitarian Review and Religious Magazine.

American Bee Journal.

Subjoined will be found the Reports of the different Departments of the College, the proceedings of the Board of Trustees, and the reports of the Agents for College Lands.

Respectfully submitted,

A. S. WELCH.

REPORTS OF INDUSTRIAL DEPARTMENTS.

STATEMENT OF SUPT. STALKER ON THE OPERATIONS OF THE FARM.

This department includes the superintendency of the farm, the care and management of the stock, instruction in practical operations in the field, and lectures and text book recitations on Practical Agriculture and Stock Breeding.

The year has been an unfavorable one for agricultural operations. The cold and drouth of the early part of the season caused an irregular stand of corn, and the subsequent rains in June and July made it impossible to give the crops the necessary amount of cultivation.

The corn and grass on the bottom lands were seriously damaged by overflow.

We have succeeded, however, in raising and securing enough grain and hay in good condition to supply our stock.

The following are the amounts of the several crops grown on the farm the present year :

Hay.....	127 $\frac{1}{4}$ tons.
Corn.....	3669 bushels.
Oats.....	1300 bushels.
Rye....	287 bushels.
Roots.....	27 $\frac{1}{2}$ tons.
Potatoes.....	100 bushels.

While the yield has not been especially large for any of the crops, all show a fair profit, with the exception of the potato and root fields. The loss on the potato crop was occasioned by rot, and the small margin of profit on the root crop was due to the fact that the condition of the ground, owing to the wet season, made it impossible to cultivate to any extent except by hand.

The quality of everything is good, except corn, which, in common with the corn crop of central and northern Iowa, is somewhat inferior.

STOCK.

The number and kind of stock on the farm are as follows:

<i>Cattle</i> .—Short-horns	25
Ayrshires	6
Jerseys	5
Devons	2
Grades	35
Total	73

<i>Horses and Mules</i> .—Brood Mares ...	5
Geldings	5
Yearling colts	5
Mules	2
Total	17

<i>Sheep</i> .—Cotswold	6
Merino	25
Southdown ...	15
Grades	42
Total	88

<i>Swine</i> .—Of the Poland-China and Berkshire breeds	104
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The surplus stock has met with ready sale, at prices that yielded a small profit to the farm.

The Short-horn cattle on the farm, while they compose some good animals and contain some valuable blood, should be improved by the introduction of some new stock.

A few choice heifers would be a profitable investment for the farm, and would aid in building up the reputation of our herd.

A Devon bull should be purchased before another season.

Some of the horses are of inferior quality. It would be both to the credit and profit of the farm to supply their places with younger, stronger and better animals.

The flock of sheep, with the addition of eleven Spanish Merinos recently bought from the farm of A. Tracy, is a creditable one.

The swine have been materially improved, by disposing of the less valuable for pork, and by some judicious purchases.

IMPROVEMENTS.

The improvements made on the farm during the past year, were chiefly repairing old fences ; building new ones ; bringing some waste pieces of land into cultivation ; underdraining, and the erection of pig pens for experimental purposes.

LABOR.

Five men have been employed on the farm during the summer, the entire time of one man being given to the care of the stock.

The usual amount of student labor has been employed. In almost all cases the students have worked well, and the results, in nearly every instance, have been highly gratifying.

EXPERIMENTS.

On the first day of July an experiment was commenced, for testing the comparative value of different kinds of food for pigs. The food used was dry corn, soaked corn, cooked corn, dry meal and cooked meal. Five lots of pigs were selected, as nearly uniform as could be taken from a lot of fifty. Three pigs were put in each pen.

The pigs were all of Berkshire blood. They were placed in floored pens, and given nothing but their regular allowance of food with all the water they would drink.

The corn was all shelled and weighed. During the months of July and August, each lot consumed fifteen bushels of corn, or the same amount ground into meal.

The pigs were carefully weighed each week, and a complete record of the results taken.

During the last week in August, when the weather was extremely warm, pens No. 4 and 5, sustained a small loss, while No's. 2 and 3 made a slight gain.

Below are given the results.

	Pen No. 1, fed on dry corn.	Pen No. 2, fed on soak- ed corn.	Pen No. 3, fed on boil- ed corn.	Pen No. 4, fed on dry meal.	Pen No. 5, fed on cook- ed meal.
Weighed July 1st.....	491	520	468	503	519
Weighed September 1st.....	675	660	618	678	676
Gain.....	184	140	150	175	157
Gain per bushel.....	12.26	9.33	10.00	11.66	10.46

On the 1st day of September the pigs were all put upon full feed, each pen receiving the same kind of food as during the first two months.

The experiment was concluded for each pen when fifteen bushels had been consumed, except No. 2, which had consumed but $13\frac{2}{3}$ bushels up to October 25th.

	Pen No. 1, fed on dry corn.	Pen No. 2, fed on soaked corn.	Pen No. 3, fed on boiled corn.	Pen No. 4, fed on dry meal.	Pen No. 5, fed on cooked meal.
Weighed September 1st.....	675	660	618	678	676
Weighed October 23d.....	870			880	
Weighed October 25th.....		800			818
Weighed October 28th.....			780		
Gain.....	195	140	162	202	142
Gain per bushel.....	13.00	10.24	10.80	13.46	9.46

The 29th of June one hundred pounds of gypsum were applied to a plat of mixed clover and blue grass. The plat comprised one-third of an acre. One crop had been taken from the ground, and the second growth at the time of the application was about four inches high. The second crop was harvested September 25th, and yielded 5.79 pounds more than a similar plat, lying side by side with it but upon which no gypsum had been sowed.

June 10th gypsum was applied to alternate rows of a plat of corn at the rate of three hundred pounds to the acre. Yield with gypsum, 18.57; yield without gypsum, 17.14. Two plats of corn were planted on clover and timothy sod, broken the previous fall. One plat was plowed four inches deep with an ordinary sod plow; the other was sub-soiled eight inches in depth. Yield from ground sub-soiled, 6.71 bushels; yield from ground not sub-soiled, 6.55 bushels

A set of experiments was also commenced to test the yield of different varieties of corn, and different methods of planting and culture. Five varieties were planted, white and yellow dent, Clarridge, Ashmeed, and Chester county Pennsylvania mammoth. Plats of one-quarter of an acre each were planted in hills at distances varying from three to four feet—with different numbers of stalks to the hills—drilled at different widths—different plats received applications of plaster and barn-yard manure, and different times of planting, and different systems of cultivation were applied to separate plats. The results in all these were so interfered with by the condition of the soil and unfavorable weather that no reliable results were obtained.

Excelsior, surprise, probstier, and Irish oats were tried on the farm. All did well, the probstier being least inclined to lodge and the excelsior giving the largest yield.

Trials of the white Australian and white Chili wheats, the seed of which was obtained from California, were also made. Both grew well and promised a fine crop, until the heavy rains and sudden changes of temperature of the month of June, caused the grain to blight badly.

ACCOUNTS.

The following shows the balances under the several farm accounts as they appear on the Treasurer's books :

	Cr.	Dr.
Rye field.....	\$93.00	
Root field.....	.28	
Corn field.....	654.90	
Oat field	219.48	
Hay field.....	277.47	
Farm stock	190 21	
Farm teams.....	729.66	
Farm products.....	123.14	
Potato field.....		\$ 14.77
Pea field.....		8.51
Farm experiments.....		48.18
Farm household.....		472.72
Farm tools.....		92.93
Farm improvement		788.99
Inventory.....		1,624.82
To balance.....		762.78
<hr/>		
Total.....	\$3,050.92	\$3,050.92
 This shows that \$762.78 more cash has been expended		
by the department than has been received. With this		762.68
excess of expenditure, the farm has made permanent im-		
provements to the amount of.....	\$788.99	
And increased its inventory.....	1,624.82	
Which gives a balance of.....		\$1,651.03
<hr/>		
Total.....	\$2,413.81	\$2,413.81

The showing is not so good as was made last year, but there have been several damaging causes over which I have had no control.

Respectfully submitted,

M. STALKER,

Ass't Prof. of Ag. and Farm Sup't.

PROGRESS OF THE DEPARTMENT OF HORTICULTURE AND FORESTRY, FOR THE YEARS 1874 AND 1875.

HENRY H. MCAFEE, PROFESSOR.

The area of grounds embraced in this department at the date of this report, and the increase in acreage and rods which has taken place since the organization of the department at the beginning of the year 1874, are given in the following table:

<i>Present area.</i>	<i>Increase since March, 1874</i>
Natural forest..... 27.10 acres.	27.10 acres.
Artificial forest..... 12.82 acres.	8.32 acres.
Orchards..... 16.09 acres.	2.87 acres.
Small fruit plantations. 4.64 acres.	1.33 acres.
Vegetable garden..... 5.42 acres.	1.42 acres.
Nurseries..... 5.92 acres.	2.82 acres.
Flower gardens..... .95 acres.	.79 acres.
Hedges..... 208.10 rods—.43 acres.	208.10 rods—.43 acres.
Arboretum..... 6.40 acres.	6.40 acres.
Total under culture.... 52.67 acres.	24.38 acres.
Wild..... 27.10 acres.	27.10 acres.
Grand total..... 79.77 acres.	51.48 acres.

The labor expended upon these grounds during the seasons of 1874 and 1875, has been as follows:

	<i>Hours.</i>	<i>Days.</i>	<i>Cost at \$.09 per hour.</i>
Students' labor....	14091.50	1409.15	\$1268.25
			<i>Cost at \$1.50 per day.</i>
Outside labor.....	1656.25	165.62	\$248.43
Team.....	930.25	93.02	139.53

Only the maximum wages are calculated in the above table, the rate actually paid being in some cases lower. The time during which the College is in session, and throughout which the work of this department extends, is about eight months each year, and the working days of the two seasons considered above are about four hundred and sixteen.

Counting the labor bestowed as regular labor, and comparing it with the amount of labor estimated by the best authorities to be necessary in carrying on such operations as we have been engaged in, we have the results shown in the following table :

Kinds of labor.	No. of hands or teams constantly employed.	No. of hands and teams estimated to be necessary.
Students' labor.....	3.38	men's work, 3.77 1.31 1.66
Outside labor.....	.39	
Team labor.....	.22	

This gratifying showing of economy of labor, it is to be feared, has been reached at the expense of some efficiency and thoroughness in the work done, and in the future, at least enough labor should be bestowed upon each piece of work to make the finished work as perfect as circumstances will admit.

The work done has been; raising food products for the board department of the College from the vegetable garden, and the orchards which were under cultivation in culinary crops between the trees ; producing seedlings for future forest planting; raising trees for ornamental planting, and growing grafts and budded stock, produced by the students, in their practice in pomology, from the nurseries ; growing forests in the forestry plantations ; growing fruits in the small fruit plantations, and orchards ; and furnishing adornment for the grounds contiguous to the College, from the flower borders ; growing experimental hedges; growing illustrative trees upon the arboretum and ornamental grounds ; and generally, conducting experiments wherever a reasonable probability of the attainment of useful knowledge appeared and where means and time at command would permit.

OPERATIONS IN 1874.

In the vegetable garden the area was extended by bringing into cultivation lots which had before been laid down to grass. An ample supply of nearly all crops usually produced in culinary horticulture was raised, and in some cases, through unexpectedly large yields, a considerable surplus was produced.

The season was quite a trying one, with its four distinct severe drouths, but the only failures of crops were those of celery and flat turnips, which were eaten up by the many species of locusts prevailing in the locality.

In the nurseries but little new planting was done, only about 4,500

tree seedlings being raised. The old nursery in the south-east field was removed, and the stock was disposed of wherever it could be put to advantage. This nursery stood upon a very unfavorable site, as experience had proved, and a new site was chosen under the advice of an experienced member of the late Board of Trustees, Hon. Suel Foster, in the edge of the timber, on the north-west part of the farm, and preparatory work was done upon it.

In the orchards the work was mainly care and culture, and the filling in of new trees where the winter of 1872-3 had root-killed those originally planted. Excellent growth was made in spite of the bad tree season.

In hedges an experimental line of honey locust was planted, and it has done finely since.

In forestry the ground was extended, and plantings were made of green ash, yellow cottonwood, European larch, and catalpa.

The results were very good, considering season and site, which were both trying. The ground is an open sandy loam, over a leachy gravel subsoil, and the season was exceedingly dry at times.

In small fruits the work done was to replant the vineyard, mainly with Concord. The loss of vines by the root-killing of the winter of 1872-3 had nearly cleared the vineyard, only 13 vines surviving. Though the location is rather an unfavorable one, on account of a part of its area having a leachy subsoil, yet it was thought better to attempt the raising of grapes upon the soil worst adapted to that purpose rather than upon a site more favorably located. So the new vines were put upon the old grounds, and have done finely ever since.

WINTERING OF PERENNIALS, WINTER OF 1874-5.

The character of the winter of 1874-5 was such, in its protracted and severe cold, as to give rise to some apprehensions as to the wintering of trees and shrubs, but in Central Iowa the soil was moist when winter set in, and a good snow blanket covered the ground most of the winter, so that losses in horticultural stocks were comparatively slight. The conditions, extent, and causes of injury so far as known, are given below in tabular form.

Sorts Injured.	Per Cent Injured.	Per Cent Killed.	Kind of Injury.
Silver Maple 8 yrs. old.	.10	.005	Bark burst.

Causes of injury were sudden and severe changes in temperature between Mar. 15th and 21st.

Sorts Injured.	Per Cent Injured.	Per Cent Killed.	Kind of Injury.
Yellow cottonwood 27 yrs. old	.35	.33	Root killed.

Cause, soil too open for the roots of this tree, consequently frozen to death.

Sorts Injured.	Per Cent Injured.	Per Cent Killed.	Cause of Injury.
Black walnut.	.12	.10 root killed.	Same trouble as last.
European larch	.24	.09 root killed.	Same trouble as last.
Concord grape. No injury or loss.			
Rogers' Hybrid grapes, protected.	.40	.10 root killed.	Same trouble as last.
Rogers' Hybrid, not protected.	1.00	.90 root killed.	Same trouble as last.
Apple trees. Loss of 50 per cent. of fruit buds on old trees.			
Raspberries.	1.00	.00 canes frozen or dried down.	Dry winds of winter.
Strawberries. No injury.			
Pears. No injury.			
Cherries, on Mahaleb roots.	1.00	.40 root killed.	Tender roots.
Cherries, on Morello roots.		Loss of most of the fruit buds.	Dry winds.
Evergreens.		Considerable loss of foliage.	

The results of, and kind of, protection given to grapes are mentioned in the history of experiments following. The value of inverted sod as a protection to half hardy shrubbery and herbaceous garden perennials has been shown in the fine condition in which the plants so protected came through the winter. Every fact of the winter's, history of the subjects of the horticulturist's care shows that dry air and dry soil are the destructive conditions most to be feared and guarded against in this region.

OPERATIONS OF 1875.

In the vegetable garden the crops of this year were as much injured by excessive moisture as were those of 1874 by aridity, yet an adequate supply of most sorts of vegetables was raised for board

department, and even an excess of some kinds. Such failures as we suffered in crops were this year, as last year, due to insect depredations, the culprits this year being the cut worms. The crops devasted were lettuce, peas, and radishes.

In the nurseries the new productions were one thousand and two hundred forestry seedlings, and five hundred apple grafts made by the class in Pomology. The growth of the year has been good. In the orchards additions have been made to area, and the number of varieties of apples; while the entire orchard of pears, cherries, and apples has been planted.

The orchards now contain eighty varieties of apples, six varieties of cherries, two varieties of plums, and thirteen varieties of pears; and in all, one thousand three hundred and thirty-one trees. Growth has been excellent. In hedges the area has been more than doubled by adding more honey locust, and by planting a hedge of arbor vitæ to reinforce the shelter-belt west of the vegetable garden. Fine growth has ensued. In forestry the area has been considerably extended and several more species added, until now the forestry plantations contain:

Yellow cottonwood.....	1131
Green ash.....	13142
European larch.....	2130
Black walnut	1100
Butternut.....	15
Honey locust.....	657
Silver maple.....	888
Scarlet maple.....	196
Catalpa.....	190
Ash leaf maple.....	4000
Red pine.....	132
American larch.....	57
Birch.....	20
White pine.....	105
Shell bark hickory.....	212
American elm.....	470
In all.....	24365

In culture, some crop was forced to suffer through a serious lack of team labor, and the lot fell most heavily on the young forest trees, and the results of lack of culture, even in a good growing season, are greater losses and less growth, with greater expense, because of the added cost of extra hand labor. In small fruits, additions to areas and

numbers, and varieties were made. A large set of sorts of currants are now on trial, and a fair assortment of hardy raspberries in good condition.

INSECT DEPREDACTIONS.

Peculiar phenomena, worth recording, have appeared in the visitations of destructive insects. 1874 was preeminently a locust year and all crops suffered by their greed. The hateful locust of Colorado did but little damage, but other allied species were very destructive. *Per contra* in 1875, but few locusts occupied our grounds. Last year the larvæ of the little cabbage moth, (*Plutella cruciferarum*,) appeared upon all cruciferous plants in myriads, and seriously damaged the looser headed varieties of cabbages, while in 1875 not twenty were noticed upon our cabbages. In 1874, cut worms were not unusually numerous, while in 1875 they were so plenty as to destroy some crops; even such strong growers as peas were almost all eaten up for us, on some lots of the garden. The Colorado potato beetle has evidently met its match in the predatory insects which attack it, and only six hours work in gathering the beetles was necessary in the two seasons, to adequately protect the crops.

The following list of insects observed to have been injurious to trees and plants cultivated in this department, is not by any means intended to be a complete list of the injurious insects of this region, but it embraces those which have accomplished a material and noteworthy injury :

PROPER NAME.	COMMON NAME.	WHAT IT HAS INJURED.
<i>Acheta abbreviata</i>	common cricket	cabbage and floweri'g plants.
<i>Acheta vitata</i>	little striped cricket.....	pinks, phlox, verbenas.
<i>Ecanthus niveus</i>	tree cricket	raspberry canes.
<i>Aphis brassicae</i>	cabbage louse.....	cabbage.
<i>Agrotis devastator</i> and other <i>Agrotidians</i>	cut worms.....	{ peas, beets, radishes, let- tuce, raspberry shoots.
<i>Aspidiotis Harrisii</i>	Harris' bark louse	apple.
<i>Cimbex</i> (?).....	willow saw fly.....	white willow.
<i>Caloptenus differentialis</i>	yellow locust.....	all garden vegetables.
<i>Caloptenus-femur-rubrum</i>	red legged locust.....	all garden vegetables.
<i>Caloptenus spretus</i>	hateful locust.....	all garden vegetables in '74.
<i>Carpocapsa pomonella</i>	coddling moth.....	apple.
<i>Clisiocampa decipiens</i>	tent caterpillar	apple and cherry.
<i>Cetonia Inda</i>	corn beetle.	sweet corn.
<i>Conotrachelus nenuphar</i>	curculio	plums
<i>Chrysobothris femorata</i>	flat head borer	apple, maple.

PROPER NAME.	COMMON NAME.	WHAT IT HAS INJURED.
<i>Doryphora 10-lineata</i>	Colorado potato beetle	Solanaceous plants.
<i>Datana ministra</i>	hand maid moth	apple, oak.
<i>Diabrotica vitata</i>	cucumber beetle	Cucurbitaceous plants.
<i>Diabrotica 12-punctata</i>	cucumber beetle.....	Cucurbitaceous plants.
<i>Gastrophaca Americana</i> ...	lappet caterpillar	apple.
<i>Lachnosterna fusca</i> and other May beetles.....	white grub and May beetle	{ all kinds of roots, and pop- lars, and willows.
<i>Lytta vitata</i>	blister beetle.....	potatoes, beets.
<i>Lytta cinerea</i>	blister beetle.....	honey locust.
<i>Lytta atrata</i>	blister beetle.....	silene and asters.
<i>Meloe angusticollis</i>	oily blister beetle.....	lettuce.
<i>Mytilaspes ulmicorticis</i>	elm bark scale.....	red and white elm.
<i>Mytilaspes salicicorticis</i>	willow bark scale.....	white willow.
<i>Orgyia leucostigma</i>	white marked vaporers	apple maple.
<i>Phycites nebulo</i>	rascal leaf crumpler.....	apple, thorn.
<i>Plutella cruciferarum</i>	little cabbage miller.....	Cruciferous plants, 1874.
<i>Pieris Protodice</i>	large cabbage miller.....	Cruciferous plants, 1874.

Diseases observed upon stock of this department. — Perhaps fewer than common of the host of fungous growths, which unceasingly work destruction to our plants, have put in an appearance and accomplished hurtful results during the past two seasons. *Pear fire blight* has injured or destroyed all but one of the old pear trees in the Farm house orchard, the dry summer of 1874 seeming to have favored this disease, as it appeared then to a considerable extent, and the wet, cool, summer of 1875, appears to have been unfavorable to it, for none of it appeared in the latter year. It is noteworthy that the only large pear tree upon the College grounds, that is healthy and entirely free from this disease, had, till lately, a large mass of thorny sprouts from the seedling root growing up around, and completely shading its stem. It may be within the range of possibilities, that perfect protection to stem and large branches, by foliage, may decrease the tendency to fire blight. The suggestion offered by this one remaining healthy tree, is, at least, worthy the test of future experiments.

Apple twig blight appeared upon Talman Sweet and Transcendent, in 1874, as it usually does upon these varieties, but in 1875 no trace of this disease was to be seen on the College Farm.

A fungus which affects young raspberry cane, and which seems to be upon the increase, especially upon warm loose soils, has injured the canes of Davison's thornless raspberries so much, that not much fruit can be borne by them next year. The disease manifests itself by the

appearance of dark moldy specks and spots upon the tender shoots in June, and when it spreads over a large portion of the surface, as it does in a few days, growth is arrested, and the shoot attacked often dies away completely, while in other cases, it lives till winter and then succumbs. New and healthier shoots often spring up later in the season, and these do not seem so liable to attack as the early ones.

No remedial measures have yet been taken. The disease appears upon all our varieties of raspberries, but only upon the Davison's to such an extent as to seriously damage them.

The *grape fruit rot* appeared early in July, and attacked the fruit of Goethe (Roger's 1,) Wilder (Roger's 4,) Merrimac (Roger's 15,) so severely, that scarcely a perfect berry remained. The disease first developing upon the fruit, as a minute speck, from which rot extended in every direction, had ceased extending after four days from its first appearance, though many of the vines, of the varieties affected with the fruit rot, continued to have mildewed foliage until near the end of the season. The attack of the fruit rot occurred in the midst of a hot, moist spell of weather, the same that seemed to furnish the favorable conditions for the development of the blight or scale, which generally affected the wheat of this region. As soon as cooler weather came, the disease seemed to extend. Concord grapes, contiguous to the Roger's grapes, were very slightly affected with the rot, and not at all with the mildew of the foliage.

The *potato rot* occurred in all but one of the varieties of potatoes raised in the season of 1873, and it was much worse upon ground which was for a long time saturated with water, through the inability of the drains to carry the surplus off. In a few cases, in such ground, not a sound tuber was left in a hill at the time of digging. The larger growing, and the later potatoes, suffered most. But one variety, Royal Gem, entirely escaped the disease, and that grew upon soil which gave the poorest result in other varieties; hence it is fair to presume that it has more power to resist this disease than other sorts. The behavior of this disease, this year, is a practical injunction in favor of thorough draining, and the policy of planting several varieties so that, at least, some may not be destroyed. A peculiar fungus attacked the leaves of Swiss chard in September, 1875, in some cases destroying all the foliage, but not rotting the root. This attack is something new to the writer. It also attacked blood turnip beets, growing near the chard. Red spider and a fungus together destroyed some of the early dwarf beans. The yellow cottonwood suffered both seasons from a

yellow rust upon the leaves, the attack evidently interfering with growth and injuring the trees. All cottonwoods in the vicinity of the college farm suffered with this rust, except those which grew near the railroad, where their foliage was almost daily treated to sulphurous coal smoke.

The club-foot attacked early cabbage and cauliflower this year, and destroyed nine-tenth of the crop. Late cabbage has suffered a little, but not severely. The first evidence of any trouble was seen in the wilting of the cabbage under a hot southwest wind, and the spread of the disease seemed to depend upon the occurrence of these peculiarly wilting breezes. Whether the weather was cause or favorable condition, is not known. But the theory of an insect as the cause for this disease, is not well supported by this summer's observations. Or may it not be that there are two diseases called club-foot? The necessary intense preoccupation with the duties of the department precluded the possibility of taking time to make desired microscopic investigations into the cause of these diseases.

The following list comprises the trees and shrubs now growing in the aboretum, gardens, and ornamental grounds of the College:

PROPER NAME.	COMMON NAME.	APPARENT RATE OF GROWTH.
<i>Abies alba</i>	American white spruce.....	good.
<i>Abies balsamea</i>	balsam fir.....	good.
<i>Abies Canadensis</i>	hemlock spruce.....	not promising.
<i>Abies excelsa</i>	Norway spruce.....	good.
<i>Abies nigra</i>	American black spruce.....	not promising.
<i>Abies rubra</i>	American red spruce.....	fair.
<i>Abies arbovata</i>	pale spruce.....	fair.
<i>Acer rubrum</i>	scarlet maple.....	slow.
<i>Acer dasycarpum</i>	silver maple.....	good.
<i>Acer nigrum</i>	black maple.....	good
<i>Acer negundo</i>	ash leaf maple.....	very good.
<i>Acer pseudo-platanus</i>	sycamore maple.....	fair.
<i>Acer macrophyllum</i>	Oregon maple.....	poor.
<i>Arctostaphylos uva-ursa</i>	bear berry.....	slow.
<i>Acer platanoides</i>	Norway maple.....	fair.
<i>Aesculus glabra</i>	buckeye.....	fair.
<i>Amygdalus alba</i>	white almond.....	good.
<i>Aesculus hippocastanum</i>	horse chestnut.....	fair.
<i>Amygdalus Persica</i>	peach.....	good.
<i>Amelanchier rotundifolium</i>	service berry.....	good.
<i>Amygdalus pumila</i>	flowering almond.....	good.
<i>Berberis vulgaris</i>	barberry.....	good.

PROPER NAME.	COMMON NAME.	APPARENT RATE OF GROWTH.
<i>Berberis purpureum</i>	purple barberry	good.
<i>Betula lenta</i>	sweet birch	fair.
<i>Betula alba</i>	American white birch.....	good.
<i>Betula papyracea</i>	canoe birch.....	fair.
<i>Catalpa bignonioides</i>	catalpa.....	very good.
<i>Celtis occidentalis</i>	hackberry	very good.
<i>Carya alba</i>	shagbark hickory.....	fair.
<i>Crataegus tomentosa</i>	black thorn.....	fair.
<i>Crataegus punctata</i>	dotted thorn.....	fair.
<i>Crataegus mollis</i>	velvet thorn.....	fair.
<i>Diervilla Japonica</i>	wigelia rosea.....	good.
<i>Fraxinus viridis</i>	green ash.....	very good.
<i>Fraxinus Americana</i>	white ash.....	very good.
<i>Forsythia suspensa</i>	forsythia	very rapid.
<i>Fraxinus excelsior</i>	golden ash.....	good.
<i>Gleditschia triacanthos</i>	honey locust.....	excellent.
<i>Gymnocladus Canadensis</i>	coffee nut.....	good.
<i>Juglans nigra</i>	black walnut.....	very good.
<i>Juglans cinerea</i>	butternut.....	very good.
<i>Juniperus Virginiana</i>	red cedar.....	fair.
<i>Kerria Japonica</i>	corchorus.....	very good.
<i>Larix Americana</i>	tamarack	good.
<i>Larix Europea</i>	Tyroiese larch.....	good.
<i>Lonicera Tartaricum</i>	tartarian honey-suckle.....	good.
<i>Morus rubra</i>	mulberry	fair.
<i>Myrica cerifera</i>	wax myrtle.....	fair.
<i>Philadelphus coronaria</i>	mock orange.....	good.
<i>Philadelphus augustifolia</i>	mock orange.....	fair.
<i>Pinus Austriaca</i>	Austrian pine.....	good.
<i>Pinus resinosa</i>	red pine.....	fair.
<i>Pinus sylvestris</i>	Scotch pine.....	very good.
<i>Pinus prostrata</i>	college dwarf pine.....	very good.
<i>Pinus strobus</i>	white pine.....	very good.
<i>Populus alba</i>	abele	very good.
<i>Populus dilatata</i>	Lombardy popular.....	very good.
<i>Populus monilifera</i>	cottonwood	very good.
<i>Populus angostata</i>	willow cottonwood.....	fair.
<i>Prunus Virginiana</i>	choke cherry	good.
<i>Prunus serotina</i>	cabinet cherry.....	good.
<i>Prunus Mahaleb</i>	perfumed cherry	good.
<i>Prunus Cerasus</i>	morello cherry	good.
<i>Prunus Pennsylvanica</i>	pin cherry	good.
<i>Prunus domestica</i>	plum	good.
<i>Prunus Americana</i>	Iroquois plum	poor.
<i>Prunus Chicasa</i>	Chickasaw plum.....	good.

PROPER NAME.	COMMON NAME.	APPARENT RATE OF GROWTH.
<i>Pyrus Malus</i>	apple	good.
<i>Pyrus communis</i>	pear	good.
<i>Pyrus prunifolia</i>	Siberian apple.....	good.
<i>Pyrus coronaria</i>	sweet scented crab.....	fair.
<i>Pyrus Americana</i>	American mountain ash.....	good.
<i>Pyrus aucuparia</i>	mountain ash.....	good.
<i>Pyrus quercifolia</i>	oak leaved mountain ash.....	very good.
<i>Pyrus paradisiaca</i>	paradise apple.....	slow.
<i>Quercus alba</i>	white oak.....	fair.
<i>Quercus macrocarpa</i>	burr oak.....	fair.
<i>Quercus rubra</i>	red oak.....	fair.
<i>Rhus glabra</i>	sumac	good.
<i>Ribes aureum</i>	Missouri currant.....	good.
<i>Ribes rubrum</i>	currant (varieties).....	good.
<i>Ribes nigrum</i>	black currant	good.
<i>Rosa blanda</i>	wood rose	good.
<i>Rosa</i> ———	domestic roses (in variety).....	
<i>Rubus occidentalis</i>	cap raspberry (in variety)	
<i>Rubus strigosus</i>	prickly raspberry (in variety)....	
<i>Salix alba</i>	white willow.....	
<i>Salix vitellina</i>	yellow willow.....	good.
<i>Salix Forbyana</i>	Forbe's willow.. ..	good.
<i>Salix</i> ?	leather willow.....	good.
<i>Salix</i> ?	diamond willow.....	poor.
<i>Salix rubra</i>	osier willow.....	good.
<i>Spiraea opulifolia</i>	ninebark	good.
<i>Spiraea salicifolia</i>	willow spiraea	good.
<i>Spiraea thalictroides</i>	rue leaved spiraea.....	good.
<i>Spiraea Corymbosa</i>	corymbed spiraea.....	good.
<i>Spiraea prunifolia</i>	bridal wreath.....	good.
<i>Spiraea sorbifolia</i>	pinnated spiraea.....	good.
<i>Symphoricarpus vulgaris</i>	coral berry	good.
<i>Symphoricarpus racemosus</i>	racemosus.....	good.
<i>Seringa vulgaris</i>	lilac	good.
<i>Seringa Persica</i>	Persian lilac.....	good.
<i>Thuja occidentalis</i>	arbor vitæ	good.
<i>Thuja aureum</i>	golden thuja.. ..	good.
<i>Tilia Americana</i>	basswood	slow.
<i>Tamarix galica</i>	tamerisk.....	rapid.
<i>Ulmus fulva</i>	red elm.....	rapid.
<i>Ulmus Americana</i>	white elm.....	rapid.
<i>Vaccinium Pennsylvanicum</i>	blueberry	very slow.
<i>Viburnum opulus</i>	bush cranberry.....	rapid.
<i>Viburnum sterilis</i>	snowball	good.

In all, one hundred and fifteen species to which additions are to be made until all woody growths which will live and thrive upon the college grounds have been planted. As a means of practical illustration in horticulture and arboreculture, such a collection will be above any estimate of value for the student of the future.

THE WANTS OF THE DEPARTMENT.

The efficiency of this department, as a means to aid the acquisition of a complete industrial education, would be largely augmented, if to its present facilities for instruction and illustration was added a horticultural laboratory, a building suitable for all work necessarily done under roof, and furnishing storage for products to be wintered. Considerable loss and detriment has occurred through lack of proper storage capacity, and the whole of the important subject of culture under glass is, and has been without means of proper illustration, through the lack of plant and propagating houses.

Out-door horticulture, though perhaps the most important part of the art, is yet but a part, and the work of the department must continue to be far from complete, until proper structures for this department are provided. State aid should be granted for this important and much needed addition to this department.

Water should be laid to the hot-beds, and so arranged that experiments in irrigation may be made upon certain sorts of plants. The northwest tract of wood land, set apart to this department, should be somewhat improved, to make it a model of native forestry, and in that way a valuable illustrative apparatus for classes. A drive should be constructed through it, and surplus trees removed, and vacancies filled by planting.

Appropriations, in addition to the regular appropriation for support of this department, are recommended for the purpose of furnishing the water supply mentioned above, and to improve the northwest tract.

EXPERIMENTATION.

Appended is a history of such of the experimentation of this department for 1874 and 1875, as seems to have been productive of results of noteworthy importance. As all our operations are really of the nature of experiments, the whole history of the department is but the statement of the present results, in an attempt to prove the value of industrial education. Only lack of time and means has prevented the full

and more orderly investigations which such a department should undertake, and it is to be hoped that facilities for experimentation may be in future extended, until every quest for horticultural knowledge may be met by the most satisfactory replies possible, the results of actual test.

In the experiments here given, where descriptions of soil are omitted, it is to be understood that the description of the soil, subsoil, and clay bed beneath the subsoil, is as follows: Soil porous, dark brown sandy loam, of rather coarse texture, of rather low capilarity, and low hydropscopic power, ranging from two and one-half to three feet deep, and resting upon a very open, loose textured, yellow, sandy clay; seeming to have been formed largely from rotten granite, with fragments of half rotten dolomite, and in depth from four to fourteen feet. This subsoil usually rests upon a heavy bed, sometimes one hundred feet thick, of very compact blue clay hard-pan, almost impervious to water. This combination of soil, subsoil, and hard-pan, makes up most of the area of the College farm; and the only exceptions to it, under culture in this department, are the gravel ridges, and the peaty strata mentioned in certain of the experiments.

EXPERIMENTS—1874-75.

Vegetable Garden No. 1.—Potatoes.—1874.—The object of this experiment was to test the comparative yield per acre of ten varieties of potatoes, in ordinary field planting and culture. Soil, a black, mellow, sandy loam was selected, of coarse texture, and very porous. The sub-soil was yellowish, sandy clay, with calcareous and silicious grit, rotten granite, bedded upon a dense blue clay hard-pan, very impervious to water, and lacking capillarity. No manure was ever applied. The land was plowed in spring, and planted May 16th to 20th, in drills three and a half feet apart. The tubers were cut to halves and quarters, according to size, dropped about fifteen inches apart in the drill, and covered with the hoe. They were cultivated with a double shovel plow, four times, June 16th and 25th, and July 6th and 25th.

The adverse weather, in the form of drouths, affected the whole crop, but was most severe upon the earlier varieties, in some cases seeming to cause premature ripening. During at least seventy days the per cent of saturation of the air was quite low, and several southwest, hot, dry, winds occurred.

The yield, size and quality were as follows:

VARIETIES.	Yield per acre, in bushels.	SIZE.	QUALITY.	REMARKS.
Early rose.....	102.40	Medium.	Good.	Worthy further trial.
Peerless.....	104.16	Large.	Good.	Worthy further trial.
Excelsior.....	162.05	Large.	Good.	Worthy further trial.
King of the earlies.....	31.25	Small.	Good.	Unworthy further trial.
Breeze's prolific.....	179.36	Medium.	Medium.	Worthy further trial.
White peach blow.....	50.04	Medium.	Good.	Worthy further trial.
White eyed peach blow.....	46.08	Large.	Good.	Worthy further trial.
Garnet Chili.....	140.00	Large.	Medium.	Worthy further trial.
Late rose.....	81.10	Large.	Good.	Worthy further trial.
White Chili.....	40.00	Small.	Poor.	Unworthy further trial.

The average yield of the ten sorts is 94.44 bushels per acre, but, as larger areas of the more prolific sorts were planted, the actual average yield per acre was 106.15 bushels.

Vegetable Garden No. 2.—Potatoes.—1874.—The object of this experiment was to test three new varieties of potatoes, in single eye planting. The soil and sub-soil were similar to that described in No. 1, except that the land had been in clover last year. It was plowed in spring, and planted May 26th, in drills, three and a half feet apart, and single eyes dropped fifteen inches apart in the drills. The ground was cultivated twice with double shovel plow, and hoed twice, and the plants when in bloom mulched with long strawy manure. The drouth effected the early sort (Extra early Vermont) considerably, and evidently shortened its yield. The following results were reached:

VARIETIES.	Yield per acre, in bushels.	Yield per lb. of of seed pota- toes.	QUALITY.	SIZE.	REMARKS.
Extra early Vermont.....	105.17	36.50	Excellent	Medium	Worthy further trial
Brownell's beauty.....	171.27	71.75	Excellent	Large ...	Worthy further trial
Compton's surprise.....	158.73	60.00	Excellent	Large ...	Worthy further trial
Average of three varieties....	145.05	57.08			

The Extra early Vermont, as compared with the Early rose, was a little earlier to furnish good sized tubers, but no earlier in ripening. In flavor it was better, hence appears to be desirable. Brownell's beauty is a very handsome, and a very good potato, and its large yield makes it desirable. Compton's surprise has a fine yield and good flavor in its favor, but its tubers are rather rough. At least it is worthy further

trial. The mulch, no doubt, increased the yield somewhat, but the enormous yields reported in the newspapers were not reached. A rather peculiar phenomenon of growth occurred with Brownell's beauty and Compton's surprise; there were great numbers of aerial tubers produced at the leaf axils. The vines grew so densely that these superterranean tubers were not turned green by the light, but retained their natural color, and some of them attained the weight of half a pound. One end of the rows of potatoes abutted against a shelter-belt of willow, on the west, backed by a grove, and it was easy to see when digging that the crop was very much better near the shelter. As no other circumstance of the location besides the shelter, was peculiar to that part of the field whence came the greatest yield, it is probably fair to give the shelter the credit of producing the increase. The moister air of the wood, flowing out over the plants, may have been of great benefit, when they were suffering under the stress of drouth.

Vegetable Garden No. 3.—Potatoes, 1875.—The object of this experiment was to test the yield of the newer sorts, as compared with the varieties well known. A top dressing of long straw manure was applied in the fall of 1874, at the rate of twenty-five loads per acre.

The ground was not plowed in the spring, but was well dragged. The potatoes were planted in drills, about four feet apart, and being cut to single eyes, one eye was planted every fifteen inches. The culture was hardly thorough. Perry's Scarifier was run through four times, and weeds were cut out of the rows with the hoe once, but the moist season induced such a growth of weeds, that the plat was far from clean.

The following table gives the results obtained :

Name of Variety.	Yield per lb. planted.	Yield per acre.	Size.	Quality.
Breeze's prolific.....	99.80	166.50 bu.	large	good.
Early rose.....	98.00	196.00 bu.	large	good.
Extra early Vermont.....	105.00	189.00 bu.	large	very good.
Brownell's beauty.....	56.00	149.66 bu.	very large	good.
Compton's surprise.....	150.00	200.66 bu.	large	good.
Brownell's bread.....	142.00	207.58 bu.	very large	good.
Snow flake.....	100.25	260.58 bu.	fair size	very good.
Red Jacket.....	166.25	170.70 bu.	large	good.
Oatka.....	96.66	112.21 bu.	large	very good.
Genesee County king.....	141.66	280.50 bu.	large	very good.
Royal gem.....	283.33	321.06 bu.	very large	very good.

Name of Variety.	Yield per lb. planted.	Yield per acre.	Size.	Quality.
Garnet Chili.....	58.40	97.33 bu.	large	poor.
Peerless	102.48	178.00 bu.	very large	poor.
Late rose.....	48.88	97.69 bu.	large	fair.
Average of sorts.....	117.76	187.67 bu.		

The peculiarities of the season furnished conditions favorable to the development of the "potato rot," and all the roots in this experiment but one were more or less affected by that disease. This accident gave the opportunity to test the relative predisposition to be affected by the rot. Hence we have:

Vegetable Garden No. 4, 1875—Potatoes.—The object of this experiment is to test the liability of the newer sorts of potatoes to the "rot." At digging, the affected potatoes were carefully sorted out, and weighed separately. The subjoined table gives the percentage of diseased potatoes of each sort, and the rate per bushel after "seasoning," and the per cent. of small potatoes :

Varieties.	Per cent. diseased.	Rot per bushel.	Proportion of small potatoes.
Breeze's prolific.....	.10	58.5 lbs.	.08 per cent.
Early rose .....	.08	59. lbs.	.05 per cent.
Extra early Vermont.....	.11	59.25 lbs.	.03 per cent.
Brownell's beauty.....	.56	56.5 lbs.	.02 per cent.
Compton's surprise .....	.08	58. lbs.	.12 per cent.
Brownell's bread .....	.66	55. lbs.	.02 per cent.
Snowflake .....	.07	59. lbs.	.10 per cent.
Red jacket.....	.01	57.25 lbs.	.11 per cent.
Oatka .....	.01	54.75 lbs.	.10 per cent.
Genesee Co. king.....	.03	59.5 lbs.	.12 per cent.
Royal gem.....	.00	58.75 lbs.	.14 per cent.
Garnet Chili.....	.50	57. lbs.	.08 per cent.
Peerless .....	.40	60.5 lbs.	.01 per cent.
Late rose.....	.04	50. lbs.	.02 per cent.

But one variety was entirely free from rot, and that happens to have given the largest yield per pound planted, and per acre. It is fair to state, that a part of the plat of ground used in these experiments was, during most of the summer, far too wet to comport with the health of any but a semi-aquatic plant.

Vegetable Garden No. 5, 1875—Potatoes.—The object of this experiment was to test the loss of weight in seasoning of potatoes. One bushel of Peerless potatoes was weighed as soon as dug, and again every twenty-four hours for four days, the tubers being kept meantime in a box with loose cover, in the open air. The results were as follows:

Weight at digging.....	61 pounds, 14 ounces.
Weight one day after digging.....	60 pounds, 12 ounces.
Weight two days after digging.....	60 pounds, 10 ounces.
Weight three days after digging.....	60 pounds, 8 ounces.
Weight four days after digging..	60 pounds, 8 ounces.

This trial shows that a loss of over .02 in evaporated water may occur within seventy-two hours after digging potatoes, a fact pertinent to both parties to a trade in potatoes.

Vegetable Garden, No. 6, Potatoes, 1875.—The object of this experiment was to test the yield per acre of new varieties, as compared with a known variety, in common field planting. The ground was unmanured and spring plowed. The planting, in drills four feet apart, a single cut of a tuber dropped at fifteen inches. The tubers were cut to pieces, varying from one to three ounces in weight. The culture was the same as that of experiment No. 3. The results were as follows:

Name.	Yield per Acre.
Brownell's beauty.....	105.18 bu.
Compton's surprise.....	121.44 bu.
Extra early Vermont.....	114.24 bu.
Early rose.....	189.06 bu.
Average field crop.....	132.48 bu.

The rotted potatoes, of which there were many, were not taken account of in the yield, which thus represents only sound potatoes.

Vegetable Garden, No. 7, Sweet Potatoes, 1875.—The object of this experiment was to test the relative merits of ridge and flat planting. The garden soil was thrown into ridges by back furrowing with a stirring plow, or plowed level. The sorts used were Bermuda and Nansemond, and the results were, that those planted upon ridges yielded at the rate of fifty bushels per acre of Bermudas, and thirty bushels per acre of Nansemond, while those planted upon flat ground yielded nothing at all but vines and slender roots. It is fair to state that the unusually cold and moist season was generally unfavorable for this crop.

Vegetable Garden, No. 8, Sweet Potatoes, 1875.—The object of

this experiment was to test the effect upon the crop of preventing stolonification. Bermudas were planted upon ridges, and on a portion of the ridge the vines were lifted from the ground, and moved three or four times, so that very few roots caught from the vines. The remainder were allowed to run and root as they would. Upon gathering the crop, the area, where the vines were prevented from rooting, yielded four and half times as many potatoes, by measure, as that upon which the vines were not disturbed.

Vegetable Garden, No. 9, Sweet Potatoes, 1875.—The object of the experiment was to test the relative merits of deep and shallow plant-of sweet potato sets.

Part of a lot of ridges was planted to sets put in five inches deep, a part to sets three inches deep, and a part to sets one and a half inches deep. The results were as follows :

	On a scale of 100. Relative yield (estimated.)
Five inches deep.....	40
Three inches deep.....	70
One and a half inches deep.....	100

The ground was well packed around all the sets, and the culture was the same for all.

Vegetable Garden No. 10.—Sweet Potatoes, 1875.—The object of this experiment was to test the value of impact upon the soil at, and after planting. Ridges of sweet potatoes were planted, and upon a part of the ridges the earth was packed around the newly set plants ; upon another part, the ground was packed twenty-four hours after planting, and upon another part, the ground was repacked where it had been packed at planting after twenty-four hours, while upon another part, no packing was resorted to. The results were as follows :

	Per cent. of plants surviving.
Ground not packed at all.....	28
Ground packed at planting.....	89
Ground packed after twenty-four hours.....	79
Ground packed at planting and after twenty-four hours...	100

Such packing as may be done by the hand at planting, is not taken into account in this statement. The plants all had that. But the packing referred to was done by a person weighing about one hundred and thirty-five pounds, tramping the soil on each side of, and close to, the plants. It is fair to state that the weather was rather too dry at the

time of planting, and, further, that excessive porosity is probably the worst fault of the soil of the vegetable garden.

Vegetable Garden No. 11, 1875, Planting Seeds—The object of this experiment was to test the value of impact in planting seeds. The results were as follows.

Seeds planted.	No. of days till plants appeared.	Relative thickness of plants, on a scale of 100.
Salsify, packed.....	7	100
Salsify, not packed	10	72
Carrots, packed	9	100
Carrots, not packed.....	10	98
Parsnips, (3 sorts,) (probably the seeds were bad, as they never grew)		
Beets, (3 sorts,) packed	8	100
Beets, (3 sorts,) not packed.....	8	67
Radishes, (4 sorts,) packed.....	5	100
Radishes, (4 sorts,) not packed.....	6	101

The packing was done by patting with a hoe, using a sharp stroke, while those not packed were left as covered with the rake. The time of determining the relative thickness of the plants, was about ten days after the first plants appeared above the ground.

Vegetable Garden, No. 12, Planting Seeds, 1875.—The object of this experiment was to determine the relative value of loose or compact soil, as a bed under seeds.

Contiguous rows were planted with lettuce, radishes, flat turnips and onions, part upon ground mellowed up by the garden fork, to a depth of ten inches, and part upon ground not stirred more than to take out the earth to form a drill.

The results were as follows:

Varieties.	Time of appearing of plants.	Relative growth after 20 days, on a scale of 100.
Onions, mellowed soil.....	11	100
Onions, unmellowed soil.....	9	90
Flat turnips, mellowed soil.....	7	100
Flat turnips, unmellowed soil.....	6	110
Radishes, mellowed soil.....	7	100
Radishes, unmellowed soil.....	5	100
Lettuce, mellowed soil.....	10	100
Lettuce, unmellowed soil.....	8	120

It is to be considered that the unstirred soil was perhaps the warmer, and hence gave favorable results, as the experiment was made early in the season.

Vegetable Garden No. 13.—Tomatoes, 1875.—The object of this experiment was to test the value of bud pruning young plants.

The young plants of Trophy tomato were, part of them, deprived of their terminal growing point, when they had their fifth leaf, and they, with other unpruned plants, were transplanted to the garden when the weather was warm enough, which was about twenty days after the pruning. The results were as follows:

Sort of plants.	First fruit.	Quantity of fruit, upon a scale of 100.
Pruned plants.....	Ripe Aug. 10.....	.75
Unpruned plants.....	Ripe Aug. 6.....	1.00

Vegetable Garden No. 14.—Tomatoes, 1875.—The object of the experiment was to test the value of root-pruning upon young plants. Young plants of Trophy, Hatheway's Excelsior, and Canada Victor tomato were root pruned, by running a knife through the soil around them, when they had the fifth leaf, and they, with others of the same sorts, were transplanted to the garden about twenty days after. The results did not show any appreciable difference either in earliness of ripening, or quantity of fruit.

Vegetable Garden No. 15.—Tomatoes.—1875.—The object of this experiment was to test the value of "potting off" tomato plants. Young plants of Trophy, Hatheway's Excelsior, and Canada Victor tomato were shifted into 2½ inch pots when they were showing the fourth leaf. The pots were plunged, and the plants shaded forty-eight hours, and then treated as were the untransplanted ones. When the pots began to pinch, which occurred about 28 days after potting, the potted plants, with an equal number from the original bed, were put out in the garden. At this time the plants, which had not been disturbed, were twice as large as the potted ones, and were more forward with their flowers, but the potted plants were more stocky. After transplanting to the garden, the potted plants soon exceeded the others in size, and throughout the season kept in advance. The fruit from the potted plants began to ripen 16 days in advance of that from the unpotted ones, and the crop averaged twice as much as did the others. The results attained in this experiment indicate that it would even be good economy to pot tomato plants, if the cost of pots and extra labor

was to be charged up to a single crop; but, as with care, the pots may be used for many seasons, the added expense of this extra shift is so light that it may easily be afforded by any one.

Vegetable garden, No. 16, Beans, 1875.—The object of this experiment was, to ascertain the best method of training running beans. Lima beans were planted, both in hills and drills, and part were grown to stakes, five feet high, part to bows two and a half feet high, made of willow shoots from the white willow hedge, which had been pruned down, so that it produced an abundance of vigorous shoots. These shoots were about seven or eight feet long, and each end sharpened and thrust into the ground, leaving the shoots to bow upward, about two and a half feet high, and a part of the beans were not supplied with any support. Runners were pinched off, when they were from one to two feet long upon the vines not supported, when they projected above the bows, and when they reached the top of the stakes. The ripened beans were gathered when hard freezing came, and the vines trained to bows produced one and a half times as many ripe beans as those trained to stakes, and four and three-fourth times as many as those without support. Taking into consideration the increased stability under stress of winds of the bows over the stakes, and the fact that the setting is really little more work, the bow system of training is, apparently, the more desirable system.

Small fruits, No. 17, Strawberries, 1875.—The object of the experiment was, to test the result of later fall planting. Wilson and green prolific were planted and mulched with short lawn cuttings. The experiment will not be completed till next year. The results are very fair so far.

Small fruits, No. 18, Raspberries.—The object of this experiment was to test the value of bud pruning the growth shoots. The collar shoots of certain young raspberry plants, which were set this year, were pinched off at the tip when they were a foot or less high, while the shoots upon other like plants were allowed to grow as they would. The varieties treated were Doolittle, Ellisdale, and Davison. At the close of the season, the shoots pinched were stocky bushes, with an abundance of strong lateral branches, while the other shoots not pruned are slender canes with few branches. The relative proportion of pith, (which is now dead and no longer useful to the plant,) and wood, (which contains stores of elaborated plant food designed to perfect the crop of fruit next year,) is given in the following table :

Davison was affected with a disease of fungous origin, and was too much injured in growth to serve as a test.

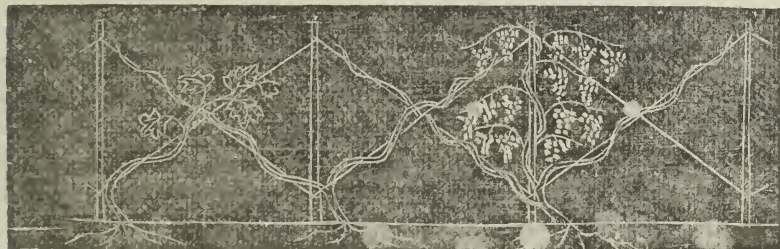
Variety.	Average thickness of wood.	Average thickness of pith.	Av. No. of branches.
Doolittle unpruned...	.19 inch.	.22 inch.	3
Doolittle pruned.....	.28 inch.	.15 inch.	9
Ellisdale unpruned....	.17 inch.	.28 inch.	2
Ellisdale pruned.....	.38 inch.	.13 inch.	7

This experiment will not be complete until after the relative quantity and quality of fruit of next year are ascertained. The great improvement in the form of the tops, as well as their increased strength, enabling them better to withstand the force of winds, and weight of snows, and the bush from which is self supporting, needing no stakes or trellis, already renders the bud pruning a desirable system, even if the fruit is not increased or bettered by it.

Small Fruits, No. 19, Raspberries, 1875.—The object of this experiment was, to test the relative value of stolons, or old stocks for a new raspberry plantation.

At the close of the season's growth, the canes of the stolons are the stockiest, and greatest in diameter, while those of the old stocks are most numerous. The cost of transplanting stolons was about one third of the cost of transplanting old stocks. This experiment will not be completed till fruitage occurs.

Small Fruits, No. 20, Grapes.—The object of this experiment was, to test a certain modification of the spiral renewal system of training. This system places the leaning cane around a stake as a helix or spiral, and trains one to three growth shoots to diagonal wires, which extend from near the base of the stake, to the tops of the neighboring stakes, as per annexed cut.



The experience of one season's trial of this system, with vines of different ages, justifies the following conclusions :

First. It appears to be the cheapest trellis in which wire is used.

Second. The direction of the wire is the best direction in which the young shoots can be trained, as it approaches most nearly the normal direction of grape shoots, allowed to climb by their tendrils.

Third. The growth shoots are out of the way of the bearing stock, and yet are not likely to extend at the expense of the fruit, as they will, if led perpendicularly up a stake near the bearing vine, as they usually are in the spiral renewal system.

Fourth. The shoots train themselves by climbing by tendril, more by this system than by any other, hence less labor is required in training. Further trial will be necessary to fairly test the system.

Small Fruits, No. 21, 1875, Grapes.—The object of this experiment was, to test the influence of *position* upon the bearing shoots of grape vines.

A part of the fruiting shoots of vines, which were showing an abundance of bloom, were trained perpendicularly. The training was done just before blooming, and at the time of training all the shoots were pinched in at the third leaf above the upper thyrus of buds. The results were : for the perpendicular shoots, an increased tendency to burst into growth at or near the ends ; many of the berries dropped before they were as large as peas ; for the longitudinal shoots, no dropping of fruit and less lateral growth ; and for the declined shoots, a little dropping of fruit from the bunches nearest the base of shoot, and which were highest, and an increased tendency to push buds from near the base of the shoot and from the vine in its vicinity. Under every aspect of the case, the horizontal shoots made the best showing, bearing most fruit, and best fruit, and requiring least attention.

Forestry No. 22, 1875, Transplanting Trees.—The object of this experiment was, to test the value of severe top pruning upon European larch (*Larix Europæa*), when large trees are to be transplanted.

Trees of about nine feet in height and a diameter at the ground of three inches, which had grown for several years in a close clump, so that they had mutually protected each other, were taken up, with the usual amount of roots which can be saved in lifting such trees. The bud scales had opened, so that the green points of the leaves were visible. Some of the trees were removed to the lawn without pruning and planted. Others were pruned so that only the stubs of the side

branches, from two to eight inches long, were left, and the top was cut off, so as to remove nearly all of the last two years' growth.

All these trees were mulched in June.

The season was one of great hardship to newly planted trees; excessive evaporation during long periods in which no rain fell, no doubt gave worse results than would be reached in an average year.

Of the trees planted without top-pruning, fifty per cent survived the season.

Of the trees top-pruned severely at planting, fifty per cent survived throughout the season.

The continuation of the experiment throughout the season of 1875, to September 22nd, at which time all growth upon larch had ceased, and most of the foliage was turning dingy yellow, gives the following additional results :

Upon the unpruned trees, the average length of the longest shoots in 1875, is two inches.

Upon the pruned trees, the average length of the longest shoots grown in 1875, is six and one-half inches.

All these trees were mulched in June, 1875.

The reasonable conclusion reached by this experiment, is, that trees of European Larch, of large size, do five times as well when pruned and subjected to the conditions these trees were placed in, as do like trees if unpruned.

Forestry, No. 24, Transplanting Trees, 1875.—The object of this experiment was the same as in No. 22.

The trees used were of the same lot as were those used in No. 22, hence they were larger, being one year older.

They were planted at the same stage of vernalion as were the trees in No. 22, and also under the same conditions, that is, in blue grass lawn, and in lawn of prairie grass.

The following table gives the results obtained up to September 22d, 1875, at which time growth for the season was matured:

TREATMENT.	Number planted.	Number living.	Per cent. living.	Longest shoot.	Longest leaf.	Average length of longest shoot.	Average length of longest leaf.	Average apparent condition on a scale of ten.
Unpruned.....	12 10	83	4 in.	13½ in.	3.4 in.	1.1 in.	4	
Pruned.....	13 13	100	18 in.	4½ in.	10.4 in.	2.8 in.	10	

The season was generally favorable for transplanting trees.

All these trees were mulched in June.

The reasonable conclusions are, that severe pruning at transplanting is advisable for European Larch. And the conclusion deducible from this experiment, confirms those deduced from No. 22 of this series.

Forestry, No. 24. Transplanting Trees, 1875.—The object of this experiment was, to test the value of severe pruning at the time of transplanting, upon Scotch Pine, (*Pinus Sylvestris*.)

To make the test as severe as possible, the transplanting was delayed until the young growth of the pine was a foot long, when a moist day was chosen, and trees of about four to six feet high were dug from the nursery and planted on the lawn.

Seven were transplanted without top pruning, and six were transplanted, so pruned that every growth point was removed, the branches all being cut off at almost the middle of last year's growth.

The results were as follows :

Treatment.	Condition	Growth of living shoot	Thickness of this year's growth.
Unpruned.....	all dead.....	.....	.....
Pruned.....	one dead, five living..	1 $\frac{1}{4}$ inches..	$\frac{1}{8}$ inch.

The old leaves of the pruned trees have remained fresh and green, and adventitious buds have been forced to push from many of the fascicles near the upper end of the pruned branches on all the living trees.

Though little extension has taken place, the trees look vigorous, and are well supplied with buds for next year's growth, and they have laid on a one eighth inch coat of new wood.

So freely have the fascicular buds been developed, that, upon the border of one tree, 36 occur in a length of 2 $\frac{1}{2}$ inches, and in that length there were but 13 fascicles which produced no buds, while several produced two or three.

A tree of about the same size as those transplanted, was pruned and left standing in the nursery, and it now appears as though every fascicle near the upper end of the leader had formed an adventitious bud, and some of these buds have made a strong growth of six inches in length, and set whorls of buds for next season's growth.

The entire loss of the unpruned trees was probably due to the late planting, and in this respect the experiment incidentally teaches another lesson than that which it was instituted to teach, namely: that it is best to avoid late planting of pines in Central Iowa, even in an exceptionally moist and cool season. The reasonable conclusions reached from

this experiment, are: First, that pine trees may safely be disbudded at transplanting; second, that severe pruning of pine trees is the safer way in late planting; third, that pine trees will throw out adventitious, fascicular buds about as readily as deciduous trees throw out ordinary adventitious buds. The results of this experiment appear to confirm the conclusion deduced from Nos. 22 and 23, and extend the principle, that severe pruning is advisable at transplanting the evergreen, as well as the deciduous conifers.

In experiments 22, 23, and 24, of forestry, the digging and planting was done by students, and every care was taken that all conditions should be uniform, so that the comparisons made should be just. These experiments show that the principle, "that trees whose roots are reduced in digging need pruning to give them a top which will not overdraw upon the roots," is general enough to include the conifers.

Forestry No. 25.—1875.—The object of this experiment was, to test the effect of heading in coniferous trees, as a means to cause them to thicken up, and so better resist the rigors of winter, and our trying winds.

About the middle of June, quite a general shearing in was given to trees of the following species, (others of the same species being left unpruned): Norway spruce, hemlock spruce, balsam fir, white American spruce, black American spruce, red American spruce, pale spruce, white pine, American larch, European larch.

The result, up to the present time, is not complete, as something depends upon how the trees pass the winter, and push their buds in the spring, but as an indication of what the result will be under the circumstances of a favorable winter, the present condition and the numbers of the buds may be taken.

In every case the heading in seems to have forced large numbers of buds which were before dormant, to push out, plump, ready for vigorous growth next spring. In the case of the American white spruce, dormant buds which had lost the heart have grown up into a whorl of axillary buds within the old bud scales. The American black spruce has pushed multitudes of small plump buds through the bark, about the base of each twig. A comparison, by counting the buds upon a given space of like sized limbs of pruned and unpruned trees of the same species, results as follows :

	Buds on space of four inches.
American black spruce, unpruned.....	16
American black spruce, pruned.....	47
American white spruce, unpruned.....	5
American white spruce, pruned.....	24

The other sorts do not show so great a difference in number of buds, but all show the stimulus of the heading in, in increased germination. In making the above count, only the adventitious and roused dormant buds were counted, upon the limbs which grew in 1874, and the regular buds upon the current year's growth were not taken into account.

In the case of both species of larch, the pruning resulted in a perceptible thickening, and an increased growth of shoots this year.

Forestry No. 26.—Straggling Trees, 1875.—The object of this experiment was, to find a correction for the straggling growth which occurs in European larch where it has lost its leader. The European larch trees in a plantation of over two thousand, a part of which had lost their leaders, were severely headed in, cutting them to a stumpy bush, and in more than half of them a good leader was forced out very nearly in line with the stem, so that, with a little interference between shoots, next spring a correct form will be assured.

Forestry No. 27.—Range of Adaptability to Soil.—1875.—The object of this experiment was to test the range of adaptability as to soil, of honey locust and green ash. Sites were selected upon sharp ridges where the soil was thin and quite sandy, and the sub-soil was a loose leachy gravel, and for the opposite conditions, wet, rather peaty bottom land, which was broken up last September, and had been since then too wet to allow the sod to rot, the character of the soil of the bottom being as diverse from the ridge land chosen as could be found upon the farm. The results are that the growth and the number living seem to average very much the same upon each plat. At least there has, as yet, been no evidence that either locality is unsuited to these trees. The experiment continues.

Forestry No. 28.—Adaptability to each other.—1875.—The object of this experiment was to test the adaptability to each other of different species of trees. A part of a plantation of black walnuts, where the trees were too scattering, was chosen, and filled in with silver maple, ash leaf maple, honey locust, catalpa, cottonwood, white elm, American larch, and green ash. The experiment will not reach any results until the trees are larger, and it is, of course, continued for a term of years.

Forestry No. 29.—Range of Adaptability to soil.—1875.—The object of this experiment was to test the range of adaptability of black walnut. Rows were planted from a bottom across a gravelly, leachy ridge, to and into a springy slough. At present the results are: the finest growth, and the largest production of those planted, are growing upon the lower, damper land, while, though a fair number came up upon the ridge, a majority of them were root killed last winter. The experiment is continuing.

Forestry No. 30.—Modes of planting.—1875.—The object of the experiment was to test the relative economy of furrow and spade-planting of young trees. Those planted with spades were thrust in behind a spade, which, after setting the depth of the blade, was pushed forward, so as to leave a space behind the blade for the tree. They were fixed into position, by pressing the earth into the spade-cut around the tree, with the foot, while the top was held upright by hand. Those put in furrows were laid in place with the roots in the furrow, and the tops inclined against the slice, when another furrow (a light one) was turned upon the trees, and a hand, taking hold of the top, brought them upright, and fixed them by tramping with the feet. With a man's labor, at nine cents per hour, and the labor of a team at fifteen cents per hour, there was a small saving in planting in furrow. And the result, as to the relative number of trees surviving, was also favorable to that method. Of those spade-planted, 94 per cent. lived; of those furrow-planted, 100 per cent. lived.

Forestry No. 31.—1875.—The object of the experiment was to test the adaptability of coniferous trees from the Wisconsin evergreen regions.

Red pine, and American larch, from Sturgeon Bay, Wisconsin, were planted upon one of our driest ridges. The result is as follows:

Red pine, one hundred and thirty-eight are living out of one thousand planted.

American larch, forty-six are living out of one thousand planted.

It is fair to remark, that this was about as severe a test as is ever likely to be applied to these trees,—though the season was favorable. The culture given them was less than fair,—nursery culture,—and not as good as most farmers would be likely to give.

Forestry, No. 32, Tree Seeds, 1875.—The object of this experiment was, to test the surface piling of tree seeds to winter them. Seeds of black cherry, basswood, white oak, red oak, burr oak, black walnut, butternut, sugar maple, shell bark hickory, and ash leaf maple,

were spread in a layer of about four times the depth of the seed, upon the top of a sharp knoll which had descent enough to carry off water rapidly, and five inches of old hay mulch was spread over the layers. No pulps or hulls were removed, except those of the hickory nuts. All, except the basswood, were found in the spring to be excellently preserved, and grew well when planted. This plan is much more economical than the usual "rot heap," where the seeds are bedded in earth, and not laid upon the surface.

Forestry, No. 33, Cheap Seedlings, 1875.—The object of this experiment was, to ascertain how cheap ash leaf maple seedling could be grown. No culture was given after planting, and as the ground used was very foul, being filled with seed of crab grass, (*Panicum Sanguinale*), the crop is quite a fair one, nevertheless; the seedlings averaging four inches in height, and standing very thickly. The account with them stands as follows:

	DR.	CR.
To preparing ground and planting.....	\$0.44	.....
To four quarts ash leaf maple seed.....	0.38	.....
	<hr/>	<hr/>
By two thousand and five hundred seedlings.....	\$0.82—	\$0.82
Cost per one thousand.....	\$0.33	.....

Under more favorable conditions, as to soil (clean, new land, for instance,) and cheaper seed, these figures may be lowered, and the crop be much better.

Forestry, No. 34, Green Ash and Honey Locust, 1875.—The object of this experiment was, to test late planting of green ash and honey locust. Trees four years old of green ash, and one and two years old of honey locust, were planted when in full leaf, and with no more than ordinary care, and in each case the operation of transplanting was a successful one.

Of green ash, ninety-three per cent. survived.

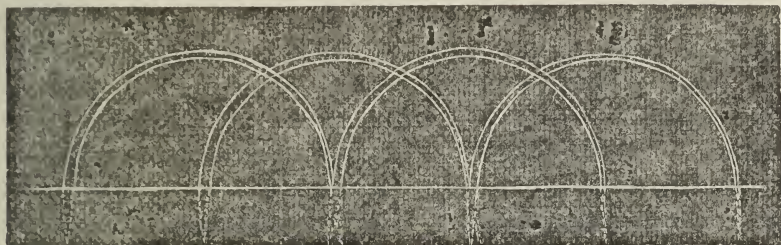
Of honey locust, ninety-eight per cent. survived.

These results were so favorable, that a conclusion is supported by them: that these species of trees are peculiarly safe for late planting.

Forestry No. 35, Cuttings, 1875.—The object of this experiment was, to test the system of double planting of cuttings.

Thrifty shoots of white willow, seven or eight feet long, were cut, and the leaves stripped off about June 10th, when in full growth, after the time it is usually safe to take cuttings, so that the test might be severe. A part of these shoots were sharpened, and pushed down

into the mellow garden ground as far as they could be thrust. Another lot were sharpened at each end, and both ends thrust into the same sort of ground as deep as could be, leaving the part above the earth in form of an arch or bow, as per cut below.



The results were as follows:

Of eleven upright cuttings planted, one grew.

Of twenty bow cuttings planted, seventeen grew.

Of the seventeen which grew, eight rooted at both ends, four rooted at the butt end alone, and five rooted at the top end alone. The suggestion of an improved way of starting willow hedges, by the results of this experiment, seems to be worthy our attention. The experiment proves, as far as one experiment may prove anything, that double setting is the surest mode with long cuttings, at least when late planted. And it shows that the top end roots as readily as the butt. So it seems we have been throwing away half our chances of growth, by setting cuttings with one end in the ground. Of course only long, pliable cuttings can be thus set, and if an upright growth is desired, finally the bow must be severed after rooting. But the form in which the cuttings were set is already a sort of fence, if strong enough, and growth gives strength. The most successful method of starting white willow hedges heretofore, has been to drive two rows of large cuttings, like stakes, the two rows inclined in opposite directions; but the form delineated above seems to have the advantage of the stake system, in a ratio of seventeen-twentieths to one-eleventh, or 85 to 9. Further trial with other sorts of cuttings is desirable and advisable.

Forestry, No. 36, Basswood Cuttings, 1874.—The object of this experiment was to test cuttings of basswood in open ground culture. One thousand five hundred cuttings of basswood were planted, and all failed to grow. The test was made under rather unfavorable conditions as to drouth; but as willows and poplars grew fairly well under the same conditions, it is fair to regard cuttings of basswood as very doubtful subjects for open ground. The experiment was undertaken

because certain public prints had advised this method of propagating basswood.

Forestry, No. 37, Pruning, 1875.—The object of this experiment was, to apply heading in to the red cedar as a remedy for winter killing of foliage and shoots. The red cedars have presented a shabby appearance in spring, from the killing out of much of the spray which gives them their beauty. Specimens were selected and severely headed in last spring.

Those which had received the worst injury were chosen to head in. The experiment will not be completed till after two or three winters test it, but present results are, a great thickening up of spray in the interior of the tree, an evident increase of vigor, and a change from the oppressed scale-like smooth foliage of the mature and declining tree, to the sharp and pointed foliage of the young thrifty tree. Thus far, then, in the experiment, prospects are fair for achieving the result desired.

Orchard, No. 38, paper wraps, 1874—This experiment was undertaken to test the value of building paper as a protection to the bodies of trees in winter. A portion of a young orchard was selected, and the bodies of the trees which were about two inches in diameter were wrapped with common "aluminum board" building paper, at a cost for paper and labor of three cents per tree. Earth was mounded up around the bottom of the paper. As no gnawing by rabbits or mice was done in any part of that orchard, the paper did not prevent the gnawing of rodents as was designed, but other results seem to be favorable to the wraps as an economy, as follows: The present condition of the trees wrapped compared with those not wrapped, seems to show in favor of the wrapping in two or three points. First,—The growth has been more vigorous by at least 15 per cent. on the trees wrapped. Second,—There has not been so great a tendency to send out sap shoots from the bodies of the wrapped trees, and there is no sign of any deposit of eggs of the flat headed apple tree borer, (*Chrysobothris femorata*) on the bodies of the wrapped trees, and there are a few cases of young borers' work upon the bare bodied trees. The bark of the wrapped trees looks very fresh and thrifty, and the bodies seem to be thicker in proportion to the tops than are the others, but as no measurements were taken before wrapping, by which a comparison may be accurately made, the observer may be mistaken on this point. The increased growth upon the wrapped trees seems to be sufficient to well pay for the cost. As incident to this operation, another fact of

some little importance appears. Most of the wraps were tied with bast, which one winter disposes of, and the paper must be retied or falls off. But a few were tied with unscoured woolen yarn, which resists decay, and is sound yet. So that we see woolen ties will last and bast ties will not, hence woolen ties may be used for putting on wraps, when they are intended to stay, but not for putting in buds, where the trees when they grow will be choked off by the too lasting ties.

Flower Garden, No. 39, Seed planting, 1875.—The object of this experiment was, to test the relative merits of mellowed or unmellowed garden soil for early flower seeds. Part of the ground was dug up with spading forks, so that it was very mellow, sixteen inches deep, and a part was not disturbed, save to make drill marks. Drills were planted across both plats with seeds of *Dianthus Sinensis*, *Phlox Drummondii*, *Gillia tricolor*, *Antirrhinum majus*, *Petunia hybrida*, and a number of other hardy annuals. The results were, earlier springing and a thicker growth upon the unmellowed soil, so much so, that, until mid-summer, the difference was largely in favor of the plants upon that part of the plat.

How much of this difference, in favor of unmellowed soil, may have really been due to the undisturbed soil being for a time the warmer, the writer could not undertake to say, but this experiment seems to be evidence in favor of shallow surface stirring, on naturally mellow soil for early planting.

Surface Applications, No. 40—Mulch, 1874.—The object of this experiment was, to test the relative value of mulch or culture upon cottonwood and green ash. The portion mulched was covered in the latter part of the summer of 1874. At present, a slight difference in favor of the trees mulched is perceptible in the cottonwoods, but numbers of cottonwoods were root-killed last winter, and the proportion killed where the mulch rested seems to be as great as where the ground was comparatively bare. Green ash has made the best growth where cultivated.

Surface Applications, No. 41.—Manure Mulch, 1875.—The object of this experiment was, to test the value of manure top dressing upon large apple trees, which were suffering because sod bound. Two trees each, of Talman sweet and Raule's janet, were mulched in May, with fresh manure about four inches deep, over as broad a surface as the top covered, which in these cases was about two hundred and fifty square feet. A like number of the same varieties located contiguously were not treated at all. The locality was a close sodded blue grass lawn,

which had been laid down to grass five years. The present results are, that the trees mulched have put on a ring of wood-growth this year of three times the thickness that those not mulched have made. The largest leaves, and largest growth on each variety mulched and unmulched, are given below :

	Breadth of leaf.	Length of leaf.	Length of shoot.	No. of shoots on a tree more than 3 inches long.
Raule's janet, mulched . . .	$1\frac{7}{8}$ in.	$3\frac{1}{8}$ in.	13 in.	279
Raule's janet, unmulched . .	$1\frac{1}{2}$ in.	3 in.	7 in.	29
Talman sweet, mulched . . .	$2\frac{1}{8}$ in.	4 in.	26 in.	349
Talman sweet, unmulched . .	$1\frac{1}{2}$ in.	$3\frac{1}{8}$ in.	9 in.	28

This experiment is not yet complete, and it is probable that farther mulch will need to be added next year, but in so far as it has revived the growth of large apple trees, which had begun the decline (which, in the West, soon leads to their death), it is already a success. It proves that rich mulch will do what all orchardists need to have done, after their trees have stood in blue grass a few years.

Surface Applications, No. 42.—Clay and peat, 1875.—The object of this experiment was, to test the respective merits of subsoil, clay and peat as top dressing. A portion of the flower borders was selected and a plat (No. 1) top dressed with subsoil clay about half an inch deep, just deep enough to entirely hide the black soil. Another plat (No. 2) was dressed half an inch deep, with a mixture in equal proportions of subsoil clay and rotten peat. A third plat (No. 3) was dressed to the same depth as were the others, with rotten peat alone. A fourth plat (No. 4) was left without dressing. These plats were planted to seedling verbenas, which had been started in hot-beds. As soon as any growth was perceptible, the plants upon the clay dressing began to take the lead.

Those with half clay and half peat were next in order of vigor, and third, those where no dressing was applied, while the peat dressing gave poorest results, and a number of the plants on this plat were burned off and killed, during a temporary hot spell of weather in June. The relative order of vigor of growth indicated above, was maintained throughout the season, and the first, and last, and most abundant bloom and seed occurred in the clay. All the plats did well comparatively, and the season was one very favorable for verbenas, but the clayed plat was superlative in its way.

It seems fair to attribute to this peculiar clay subsoil the superiority

in the way of rapid growth, early maturity, increased inflorescence, and increased fruitage of plat (No. 1).

Surface Applications No. 43.—Clay.—The object of this experiment was, to test the value of the upper subsoil of the College garden, as a top dressing for tomatoes. In planting the several sorts of tomatoes grown this year, rows of plants were set across a narrow strip of ground, upon which had been placed a light dressing of the yellow, sandy, marly clay subsoil, taken out of the bottom of a root pit, about four feet deep. This subsoil was somewhat mixed with the surface soil, and in culture during the season became quite intimately blended with the soil, so much so that by autumn its yellow color was lost in the general black of the common soil. The result was somewhat surprising in the effect upon the time of maturity of the fruit. The first fruit ripe in the clay was picked July 20th, while the first ripe on the black soil was picked August 25th. The quantity borne by the plants in the clay was somewhat less than was borne by the others. (This subsoil, occurring at three feet deep from the surface, and overlying the heavy bedded blue clay hardpan of Central Iowa, should not be called a clay, though it is generally so designated. It spades easier than does the top soil, and seems to lack the adhesiveness of a true clay.) No chemical analysis has yet been made of this peculiar deposit, so far as the writer knows, though its excellent behavior as a top dressing indicates that it merits such attention.

Surface Applications, No. 44.—Lime.—The object of this experiment was, to test the value of lime to arrest the effects of "club foot" in cabbage. The early cabbage began to show the effect of the disease, technically known as "club foot," just before heads began to form, and a dressing of slaked lime, at the rate of twelve bushels per acre, was given, by sowing over all broad cast. The dressing was continued across a plat of the late cabbage, also. No beneficial effect as to the "club foot" seemed to follow the application, for most of the crop of early cabbage was destroyed. The late cabbage was not much affected by the disease.

Surface Applications, No. 45.—Manure and Clay.—The object of the experiment was, to test the value of manure, and of clay sub-soil dressing, upon spring planted strawberries. Colfax strawberry plants were planted in double rows for matted beds in spring, and a part dressed with half an inch of subsoil from four feet deep, another plat dressed with three inches of fresh horse manure, and a third plat, not

top dressed, but cultivated, while a fourth plat was left uncultivated. The results appear as follows at the close of the year, though the experiment will not be complete till the effects of the different treatments can be seen on next year's fruitage. The part dressed with manure has the finest foliage, and largest number of stolons; the part dressed with clay has somewhat fewer stolons, and leaves as large, but is not so tall. The part uncultivated has fewer stolons than the preceding, and not so full foliage. The part cultivated is poorest in appearance of any, though still very good.

Forestry No. 46.—Extension of duramen.—The object of the experiment was to test the rate of the advance of the duramen upon the alburnum in cut timber while seasoning slowly. A Kentucky coffee nut tree (*Gymnocladus Canadensis*) of fifteen inches diameter was cut in March, 1875, and a log from the body, eight feet long, was hauled from the woods and laid in partial shade on the west side of a building and upon the ground where the grass grew up around it and nearly covered it. When cut, the alburnum, or sap, or live wood, occupied a space of one and one-fourth inches inside the bark, and the rest of the distance to the heart was filled with an apparently healthy and fresh looking duramen, or heart wood. In July the duramen had advanced to within one-fourth of an inch of the bark on the upper side of the log and an inch on the lower side. In October, all the wood which was in existence at the time the log was cut was duramen, but a ring of new wood had grown *since* the log was cut, and the bark all around was alive and would peel quite easily. The new ring was about one-fiftieth of an inch thick and appeared healthy and white. In this case the growth was all at the expense of the bark and alburnum already formed, and, from the fact that the new growth *occurred without foliage or root*, the bark and alburnum are proved to have contained enough of the elements of growth to make this ring. But the duramen advanced sixty-two and five-tenths as rapidly as did the growth, and actually overtook growth.

Under the favorable conditions of partial shade and moist atmosphere secured by the grass around and the earth below, and a rather cool season, life was maintained and growth occurred; but as all supplies of the mineral elements of growth were cut off, only such growth took place as the material already stored (to provide for vernalion) would supply. Such elaboration of materials took place as the chlorophyll cells in the outer live bark could accomplish, and the new layer

of wood grew one-fiftieth of an inch while death approached at a rate sixty-two and one-half times as fast.

Small Fruits, No. 46.—The object of this experiment was to test the hardiness of Roger's hybrids and Concord grape vines. The vines were generally protected by laying upon the earth and covering with earth two to four inches deep, and over that spreading a mulch of straw manure as much thicker. A part of each row was left with no cover or shelter whatever. The results were as follows :

Concord protected, all living.

Concord unprotected, all living.

Roger's hybrids protected, 90 per cent. living.

Roger's hybrids unprotected, 10 per cent. living.

Other experiments are in progress, but as yet furnishing no conclusions of interest, are deferred to future reports.

ON INJURIOUS FUNGI.

BY PROFESSOR C. E. BESSEY.

Every year the farmer suffers heavy losses from the fungi which prey upon the plants he grows, nor are the losses sustained by the gardener and the forester lighter or less vexatious. These losses are no less severe because of the general ignorance of their occurrence; in thousands of cases light crops and poor growth might be traced to the parasitic fungi which sucked the sap from the growing plants. We are just now becoming pretty well aware of the great damage done by insects, but as yet we pay little heed to that done by fungi. One reason, perhaps, for this is that insects injure by eating *what has already grown*, while fungi generally bring us loss by *preventing* growth. Years of careful observation have convinced the writer that the annual loss in the United States, directly and indirectly caused by fungi, amounts to very nearly as much as that which may in the same way be charged to insects. So great is the importance of this subject, that it is proposed to publish year by year such facts as will contribute somewhat to a better general understanding of these too little known plants

BUNT, SMUT, OR STINKING SMUT.

In many portions of the United States, and to no inconsiderable extent throughout Iowa, the wheat crop is annually injured by the fungous plant known under the names of *Bunt*, *Smut*, and *Stinking Smut*. The English use the name *Bunt*, while in America the name *Smut* is of almost universal application; and here again we Americans are in the wrong, for, as will presently be shown, the name *Smut* is properly applicable to quite a different thing. This is much to be regretted, as great confusion arises in the discussion of the matter in clubs, granges, and through the public press.

In order to contribute to a more accurate use of terms, the original English names will be used throughout this article, and it is urged upon our farmers, millers, and wheat dealers, that they throw their influence in favor of this correct usage.

What is Bunt? Bunt is a fungus, and is as much a true growth as an oak tree or a stalk of wheat. It is, however, a parasite, and as such it has no green coloring matter in its tissues, and this makes it seem to differ greatly from the ordinary plants. This absence of a green color is common to all the fungi, but it is by no means peculiar to them, for there are many flourishing plants which get their food by stealing, which have not a particle of green about them, as, for example, the Dodder (*Cuscuta*), and the Indian Pipe (*Monotropa*). But, besides the matter of color, Bunt differs from ordinary plants in its tissues, which are soft and yielding throughout; they never become hardened so as to be woody, but are always readily crushed; and, moreover, they are of short duration. Further, Bunt is propagated and reproduced by minute bodies, termed *spores*, which, from their extreme simplicity, might be very properly called rudimentary seeds. But the most striking thing about Bunt as a plant, is the fact that it grows entirely *inside* of the plant upon which it is a parasite. The Dodder twines around its victim plant, and sends little sucking roots into its bark; the mistletoe grows upon the oak as ordinary plants grow upon the ground, merely sending its roots down into the tissues of its host; but this fungus which preys upon the wheat plant, is internal, and it sends its minute threads through the soft tissues, drawing from them the nourishment which should have gone to the production of the perfect grain.

Let it be understood, then, that Bunt is *a plant*, which is parasitic internally, and that it grows from, and after a while produces, small bodies,—the *spores*, or rudimentary seeds.

Its Life History.—Take up a bunted grain of wheat—the so-called “smut grain” of millers—crush it, and examine the black mass with the aid of a good microscope; the black fœtid powder will be found to be made up of myriads of small round bodies—the *spores*. Now, these spores have, so far as the continuance of the bunt is concerned, exactly the same office as seeds, and every one is capable of producing bunt in the next year’s crop. We do not yet know the whole of the life history of this fungus, and it may very properly be remarked here, that in this respect, these low forms of plant life do not possess that simplicity which is characteristic of the higher ones; instead of a simple round of seed, plant, flower, and seed again, fungi often run through many transitional stages, frequently growing during these transitions, in disguised forms upon quite different plants. This makes it very difficult to work out the life-history of the fungi; and it is hence not



EXPLANATION OF THE CUT.—Head of wheat affected with bunt; *a*, bunted grains; *b*, the same cut open, showing the mass of black spores in the interior; *c*, four spores very highly magnified; *d*, spores and threads, showing the manner of growth. [All original, excepting *d* which is copied from Cooke.]

NOTE.—By an error on the part of the engraver, the peculiar reticulations of the spores are not correctly shown in *c*. In *d* these markings are much better represented.

to be wondered at that our botanists are not yet able to tell all about the plant under consideration. This much we do know, however, that the spores sown with wheat, will sooner or later produce a parasitic growth in the new crop, and that when this growth comes to

maturity it will produce its black spores in the "bunted" grains of wheat.

It happens that the bunt plant produces its spores in just that part of the wheat plant where we usually find the grain, and from this coincidence much confusion has arisen in the minds of many. A wheat plant which has one of these parasites growing in it, attempts to produce grain, but, when the little grain is forming, the fungus sends its filaments into it and absorbs the rich material there, gradually filling the abortive grain with its deadly growth, and finally producing there its reproductive bodies—the spores. In this case, the inside of the grain *does not turn to spores* as is sometimes supposed, but the starchy matter is first absorbed by the fungus, which then produces spores upon its own tissues. It is to be observed that the *skin* of the wheat grain does not become seriously affected, so that although the fungus has possession of all the interior, the external appearance may not be greatly changed. The head of wheat, too, is not greatly different, and to a casual observer it might pass unnoticed. The differences, such as they are, are well shown in the figures above. The grains (at *a*) are seen to be shorter and thicker than usual, while the whole head is more spreading and open, so that, to one familiar with the subject, the affected heads are distinguishable at once.

Observations on Bunt.—In the year 1872, the writer made an extended series of observations upon the "bunted" wheat on the College Farm, the results of which are interesting. Selecting the "stools" of wheat (*i. e.* the bunches of wheat which grow from a single grain,) at random, it was found that in nearly all cases the heads from each "stool" were either *all free* from bunt, or *all affected* by it; very rarely some of the heads were free, while others were affected. In no case was a head found, part of which was free, while the other part was affected. These observations leave but little doubt that the bunt affects the *whole* of the wheat plant. The probability is that the fungus begins to grow about the roots, and from thence it grows upward through all the branches, finally "fruiting" in the aborted grains as described above.

Remedies.—To a certain extent, bunt may be looked upon as a *weed*, and the rule for other weeds will answer equally as well here,—*sow only clean seed*. Whenever it is possible to do so, only wheat known to be *perfectly free* from bunt should be sown. When clean seed can not be obtained, or when it is desirable, for certain reasons, to use seed which has bunt in it, the following methods are useful:

1. Thoroughly wash the wheat ; by so doing, many of the affected grains will be floated off.

2. Wash in hot lime water.

3. Wash in a solution of blue-stone, *i. e.* Sulphate of copper, called also blue vitriol. This last is the remedy relied upon by the English farmers.

GRAIN SMUT.

Another fungus found very commonly upon wheat, as well as upon oats and barley, demands attention. It is known under various names, smut, grain smut, black blast, black head, etc, but the one most distinctive which can properly be used, is grain smut. Its nature is much like that of bunt, and what was said about the internal parasitism of that plant, might be repeated of this one. There are some differences, however, which are important. In the first place, observations show that quite frequently some of the heads from a "stool" of wheat are affected, while others are free, and occasionally a head is found, one portion of which is completely destroyed by this parasite, while the other appears to be but little injured. In the second place, while in the case of "bunted" wheat the skin of the grain is not destroyed, here not only is the skin destroyed, but the chaff and beards, and occasionally the upper leaves are killed, and filled with the black dusty spores. In the third place, an important difference is that here the spores ripen and fall away, or are carried off by the winds long before the grain itself is matured.



EXPLANATION OF THE CUT.—Head of wheat affected with grain smut. At the right are shown, greatly magnified, some of the minute spores, which are flattened spheres. [Original.]

As the spores fall so early, the remedies used in the case of bunt, will here prove of little avail. Probably the greatest good can be done with the least expense, by simply sending a boy through the fields when the blasted heads begin to appear, with orders to gather them up and burn them. The labor would not be great, and certainly the good done would far more than repay all expenses.

INDIAN CORN SMUT.



EXPLANATION OF THE CUT. — An ear of Indian corn, destroyed by smut. At the right are shown greatly magnified several of the spores, which are spherical, and covered with minute prickles. [Original.]

It is generally the opinion of farmers and cattle growers that this smut is injurious to cattle if eaten in considerable quantities, and many cases of death from this cause, as it was supposed, have from time to time been reported to the writer.

The only remedy which can now be suggested is to carefully gather the masses of smut and to burn them ; this would require some time and labor, but if continued carefully for a few years, there is not the least doubt that it would pay. We cannot afford to grow a poisonous fungus, when a little labor would rid our fields of it.

Indian corn is frequently somewhat troubled with a parasite closely allied to the one last noticed. Its general mode of growth is similar to that of the smut on small grain, and still it is quite a distinct plant, as a few minutes use of the microscope will show. Like bunt it is an internal parasite, sucking the nourishment from its host, by means of myriads of minute filaments which it sends through its tissues. It produces its spores generally in the aborted grains, but not unfrequently the tassels, leaves, and even the stems bear the well known growths filled with black, dusty spores.

REPORT ON MECHANICS.

A. THOMPSON, PROFESSOR.

During the past year the Mechanical Department has put the heating apparatus in the New Physical Laboratory, together with all the furniture required for its equipment, such as laboratory tables, shelving, glass cases, seating, and gas fixtures. Over the amount required for this work enough of the appropriation remained to purchase the following fixtures: A 22 inch by 12 feet Fitchburg lathe; an 18 inch Fitchburg drill; a 22 inch by 22 inch by 5 feet Fitchburg planer, and three Parker vises. These tools are set up in the basement, and add very much to the department as means of instruction, allowing a larger range of work to be done than heretofore. All repairs upon buildings, furniture, etc., have been done, as well as considerable custom work for outside parties. The following classes have been taught:

SOPHOMORE CLASS.

Second Term.—Descriptive Geometry.

JUNIOR CLASS.

First Term.—Descriptive Geometry and Analytical Mechanics.

Second Term.—Applied Mechanics and Machine Drawing.

SENIOR CLASS.

Second Term.—Principles of Mechanism.

MECHANICS.

The Department of Mechanics is intended to prepare students for the profession of mechanical engineering, and is pursued during the Junior and Senior years by those who complete the course.

It is intended to supply a class of men who are not merely practical nor wholly theoretical; but, who, guided by correct principles, shall be

able to invent, design, construct, or manage, machinery in any of the industrial pursuits.

To this end the plan of instruction is two fold. First, *theoretical*; second, *practical*; hence, practice in the Workshop is required of all who complete the course. The theoretical instruction is imparted by means of recitations from text-books and lectures, illustrated by models and plates.

The practical instruction will consist of *projects*, in which the student shall be required to produce some machine of new design, or one which shall be of practical utility to the College or to those who may avail themselves of our advantages for manufacturing. For this purpose, the student shall have the use of the machinery and tools in the workshop, under the direction of the teacher; the instruction being according to the most approved methods of machine-shop practice. This will teach the student the manner in which the mechanical engineer carries his design into execution, and to so proportion and dispose of the parts of a machine as to secure the greatest economy in construction and durability. The student will also take indicator diagrams from the engine in the Workshop, and determine from them the power developed by the steam while working with different degrees of expansion.

COURSE OF STUDY.

Analytical Mechanics.—Representation and measurement of forces; composition and resolution of forces; principle of moments; parallel forces; center of gravity; elementary machines; motion in straight lines; uniform and varied motion; curvilinear motion; centrifugal force; moment of inertia; laws of impact and center of percussion; work done in overcoming resistance; accumulation of work; work done by motors.

Resistance of Materials.—Laws and coefficients of elasticity; work of elongation and time of oscillation, set, viscosity; modulus of strength, safe limits, tension and compression; strength of columns; theory of flexures and rupture, neutral axis; shearing stress, flexure of beams and columns; tensions; shocks; crystallization; experiments and practical formula.

Cinematics and principles of Mechanism.—Relative motions of points in any system of connected lines or pieces; motion considered independent of force; velocity ratio; investigation of the motion of the different elementary parts of a machine; correct working gear; teeth; gearing chains; escapements; link work.

Machine Drawing.—Drawings of original design; drawings completely finished in water colors, and in line drawing, and detailed drawings for the Workshop; such as are made in the best manufactories of the country; prime movers; wind-wheels, water-wheels, steam and hot air engines.

The course in the workshop is so arranged as to give the student a thorough drill in the use of all tools for working wood and iron; and in the management of wood and iron working machinery.

GENERAL DESCRIPTION OF WORKSHOP.

The wood working shop is a two-story building, thirty by fifty feet. It contains a twenty horse-power Harris Corlis engine; a boiler with Stilwell heater; eighty feet of 2 in. turned shafting, with the most improved iron hangers, and pulleys. It also contains a Fay pony planer; a Fay gig saw; a Fay sash mortiser, and a circular saw; six work-benches, with six full sets of bench tools.

The engine has a Richard's indicator fitted to it for the purpose of taking diagrams. The machine shop is in the basement of the new laboratory, and is connected with the wood working shop by means of a wire rope transmission. It contains a line of shafting 62 ft. long, which is fitted up with the best self-oiling hangers; a 20 in. by 12 ft. Fitchburg lathe; a 16. in by 8 ft. Washburn lathe; a Washburn hand lathe; a 22 in. by 22 in. by 5 ft. Fitchburg planer; an 18 in. Fitchburg drill; also a full set of fluted reamers, flat reamers, twist drills, taps, dies, etc.

DEPARTMENT OF ENGLISH LITERATURE AND THE SCIENCE OF LANGUAGE.

BY PROFESSOR W. H. WYNN.

Instruction is given in this Department in the Analysis of the English Sentence, Composition and Rhetoric, Elocution, Elements of Criticism, English Literature, and the Science of Language, distributed as follows through the years of the Agricultural and Ladies' course.

FRESHMAN YEAR.

First Term.—Analysis of the English Sentence, (Welch); Rhetoric, (Hart), with provision for separate and special exercises in Composition and Elocution, under competent instructors.

Second Term.—Kames' Elements of Criticism.

SOPHOMORE YEAR.

First Term.—English Literature, (Taine), including the direct study of Shakspeare and other English classics.

SENIOR YEAR.

Second Term.—Science of Language, (Whitney).

It will be seen that this Department includes all the branches ordinarily embraced under the head of *belles-lettres*, together with English Literature and the Science of Language. A broad and liberal foundation is laid for this course, in the drill which the Freshmen receive in the Analysis of the English Sentence, the fundamental principles of Rhetoric, and the more abstruse discussions of *Æsthetics*, found in Kames' Elements of Criticism. In the Analysis of the English Sentence, the admirable text-book of President A. S. Welch is found most serviceable; while, for an acquaintance with the more elaborate material of English Accidence, and the etymological development of the language, the student is encouraged to make free use of Richard Morris' Historical English Grammar, or his larger work entitled Historical

Outline of English Accidence. To those who possess sufficient knowledge of general Grammar to pass the examination for entering upon the Freshman Class, this advanced system of Analysis is found eminently adapted to secure proficiency in that branch; and so valuable and indispensable is the drill considered to be, that the student is invariably advised, even when he feels himself competent to pass Analysis, not to omit it from his course. This branch being concluded about the time of the second inter-term examination, the remainder of the term is devoted to a brief and practical mastery of the fundamental principles of Rhetoric, relying upon the text-book for a bare outline of topics, and supplying illustrative matter in impromptu conversations and lectures.

During the entire second term, the student will find his best energies taxed for the successful mastery of selected portions of Kames' Elements of Criticism, that old, but hitherto unrivaled, analysis of the emotions and passions in their manifold and subtle relations to the Beautiful in Art and in Language. The student here takes hold of a difficult subject, requiring habits of introversion, and close application to delicate psychological reasonings, but by slow approaches, exhaustive reviews, and free discussions in the class, the rich treasures of critical wisdom are compassed, and the courage and enthusiasm of the youth stimulated in a remarkable degree. Twice a week throughout the year, this class has a thorough drill in the practice of Essay Writing, Elocution, and delivery of original orations.

The course in English Literature has been built up with much care, through many patient and earnest experiments, and by freely consulting the experience of those, in the same line of instruction, in other Institutions. The aim has been, to determine to what extent the critical study of the mother tongue may be made to yield the culture, which in the old curriculum, was so richly provided in the study of the Latin and Greek; and, although it cannot be presumed that the stable beauties and artistic finish of these ancient classics can be found in a vernacular, or any living tongue, subject as it must be to the fluctuations, and unreasoning innovations, of dialectical growth and decay, yet the English mind has made its language the vehicle of such grand displays of genius, molding its instrument to its behest, that the great masterpieces in the Epic, History, Drama, Oratory and Song, which mark the successive epochs in English Literature, are really unsurpassed by any like productions of the Classic times. Thus Milton will rival Homer, and there can be no doubt that Shakspeare, put in the balance with

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Æschylus, Sophocles, Euripides, and Aristophanes, will outweigh them all. The culture derived from the direct study of these English masterpieces, may be sensibly wanting in some of the æsthetic advantages that attend the critical study of the Classic tongues; the task is not so directly addressed, nor is there the same scope for keenness of discernment, and delicacy of discrimination, as to the precise value of a *word*, as an individual digit in the sum total of expression,—but there is a more thorough arousing of the soul, a more effectual touching of those deeper susceptibilities, whence poetry and eloquence spontaneously spring.

It early became apparent that, in order to give English Literature a standing of respectable competition with the Classics, the question of *method* was paramount. Where the field is so vast, including at least a general survey of the origin and progress of the English language itself, and a familiarity with the history of the English mind, from the days of the Anglo-Saxon down to the present time, implicating the main currents of the civil and religious history of the English people; where the student must look through a gallery embracing the representative characters of thirteen centuries, and pause long enough, at intervals, to give his imagination and taste the well-directed exercise they should have in the premises, the great problem is, how to open out an epoch in full blaze, with the fewest number of typical facts,—a problem difficult at best, but peculiarly embarrassed by its complication with the distinctive aims of the industrial curriculum prevailing at this institution.

It occurred, then, to supplement the course by the introduction of the Science of Language, recent in origin but rich in results, to which the philological portion of our task might be conveniently adjourned. Prof. Shepard has prepared an invaluable text-book, on the Origin and History of the English Language, which, in a more expanded course, could be profitably used as a fitting introduction to this entire line of study. Incidentally, however, the same results may be obtained in the Science of Language, with the added wealth which comparative philology is now pouring, in such unstinted measures, into the rich discoveries of our time. For English Literature proper, it seemed best to use selected chapters of Fiske's Condensed Taine, reserving always the privilege of correcting, when the brilliant generalizations of the author are one sided or partial, and supplementing such facts of contemporaneous history, as would be needed to bring the epoch vividly to view. With this help, it was proposed, as the law of our progress in this study, that, on arriving at the prominent English Classics, the text-

book should be thrown aside, and, so far as practicable, the direct study of the masterpiece take its place. For example, in the Elizabethan era, the power, vigor, and marvelous creative energy of the English mind came into mature exercise, and the drama was the theatre of its activities, and Shakspeare the greatest dramatist of all time. Evidently the shortest route to the mind of that era, is in the direct study of Shakspeare. This should be done, not in the spirit of the antiquary, nor yet of the philologist, detaining on obscure constructions, or hunting every archaic form of expression to its source,—but mind communing with mind, the student yielding himself, for the time, wholly to the magic spell which the wand of Prospero will induce. Twelve of Shakspeare's most powerful plays may be rapidly analyzed, in almost the same number of recitations, and the analysis submitted to be read and contrasted with others, to which, also, the teacher may add such critical observations on the play as he may find opportunity to make. This will illustrate the method in which the direct study of the great English Classics should be conducted. It is not the time for a philological drill, but for direct intercourse with the spirit of the Master, and the free imbibing of the inspiration he supplies. To this end, a system of *analysis* or *syllabus* has been devised, which the student makes for himself, and of which he keeps a record, both of the subject matter of each recitation, and of the added information supplied in the class-room. Written examinations are held on each chapter as it is completed, the student reviewing his syllabus for the material upon which these examinations are conducted,—revisiting, in this way, many times, the epochs in which the great writers flourished, and recalling frequently the impressions their works have left.

The whole course is closed up, in the last term of the Senior year, with the Science of Language, which represents an advanced movement in philological studies, analogous to that which has given the physical sciences such an unwonted prominence in our educational schemes. It is not so much a *polite* study, as a course of rigid induction in language, taking rank, thus, as a congenial cousin-german with the scientific curriculum which prevails at this place. The student here is made familiar with the great laws underlying all language, in so far as those laws have been discovered, learns to distinguish the processes of linguistic growth and decay, to note the subtile workings of thought, and association, and caprice, in the wearing out of old terms, and the origination of new ones, and, incidentally, deals with the

deeper questions in controversy among the *savans* in this line of scientific research, such as the origin of language, its relation to thought, and the boundary lines, and probable antecedents, of the great families of tongues into which the languages of the earth are divided. Ethnological problems, as illustrated by linguistic evidence, the unity or diversity of origin of the human race; the primitive civilizations, as revealed by language in pre-historic times; the law of evolution, as discoverable in the unfolding stages of the scientific and religious consciousness of the race, in the words embalming the varying conceptions mankind have had of nature, and of the unseen powers believed to be at work behind her forces;—all these allied topics are freely discussed in the class-room, on the principle that if the results are not very definite, the student has his mind stirred, meanwhile, to unwonted activity, he gets wider and more liberal views of the great family of man, is thrilled with a fresh conception of the human capabilities and destiny, and is started out on new lines of discovery of which he, otherwise, would never have dreamed.

Prof. W. D. Whitney is deemed the safest guide in this line of scientific research, whilst free use is made of the more brilliant, but less exact, disquisitions of his great Anglo-German coadjutor and opponent, Prof. Max Muller. The student will naturally be drawn to the attractive pages of this enthusiastic explorer and bold adventurer in the dim border-land of the science, and, although on many points he may be beguiled, by the beauty and eloquence of the author's style, into accepting as valid science what are but the dreamy speculations of a sanguine intellect, it will, nevertheless, be a powerful stimulus upon his energies, and he will find a very thorough corrective in the strictly scientific work which, under the direction of Prof. Whitney, he will be required to do. There is also this special advantage in Prof. Whitney's Lectures on Language, that they illustrate the ruling principles of the science, in so far as that is at all practicable, by familiar processes going on in our own mother-tongue, so that collaterally they constitute an invaluable treatise on the philology of the English language.

Here as in the course in English Literature, the classes gather up their material in a syllabus, and denote their progress in the frequent written examinations they are required to pass.

PUBLIC EXERCISES.

This department has charge, also, of all orations and literary exercises that are made public, subjecting them to criticism before hand, and awarding them a mark according to their merit. These orations are delivered each evening in the Chapel, immediately after the devotional exercises, the first term by the Seniors and the second term by the Juniors.

REPORT OF THE LAND AGENT.

To the Board of Trustees of the Iowa State Agricultural College :

In compliance with your instructions, the following review and report of the transactions of my office, for the years 1874 and 1875, are herewith submitted for your consideration.

The charge of the lands granted to the State by act of Congress, July 2nd, 1862, was assumed by me in August, 1865, under a written contract with the Board of Trustees, by the terms of which it was required that the agency should be conducted without expense to the College, and establishing a fee of fourteen dollars per entry, to be paid by the lessee or purchaser, as the entire compensation for conducting the business of the agency in leasing, selling and patenting the lands, and collecting and paying over the rents and purchase money, for a term of ten years.

During that time I have had charge of the Land Department and have collected rents and paid over to the Treasurer of the College as follows:

For the year 1865.....	\$ 7,746.13
For the years 1866-7.....	35,764.08
For the year 1868.....	23,241.75
For the year 1869.....	31,021.43
For the year 1870.....	29,772.42
For the year 1871.....	31,969.35
For the year 1872.....	33,649.92
For the year 1873.....	26,027.54
For the year 1874.....	29,357.42
From Jan. 1, 1875, to Oct. 31, 1875.....	28,224.27

Total amount of interest collected and paid over..\$279,774.31

During the same time I have collected and paid over Endowment Fund as follows :

For the year 1869.....	3,005.14
For the year 1870.....	3,327.27
For the year 1871.....	1,109.92
For the year 1872.....	3,219.80
For the year 1873.....	1,080.00
For the year 1874.....	2,900.00
From Jan. 1, 1875, to Oct. 31, 1875.....	37,912.24

Total am't of Endowment collected and paid over. \$52,554.37

The foregoing Endowment Fund has been collected from lessees who have availed themselves of the privilege of purchase granted by the terms of the lease.

Owing to loss of crops in the north-western counties, and the general financial depression, there was a falling off in the revenues of the College for the years 1873 and 1874. But during the current year leases of forfeited lands have been made at a considerable advance in price, and during the year the revenue of the College derived from rents already collected, together with estimated collections for the months of November and December, will amount to the sum of about \$34,000.00, an increase of near \$5,000.00 over the preceding year, notwithstanding the decrease of revenue occasioned by the payment to the Treasurer of \$37,912.24 of the permanent endowment fund. There are now upon the records of my office, leases unexpired and leases that have been at different times renewed, under the several acts of the General Assembly, for a period of ten years, amounting in all to 150,199.55 acres, the rents being made payable at my office.

It will probably be safe to estimate the income payable at my office for the year 1876, from all sources, at about thirty-five thousand dollars, (\$35,000.00.) The lands when forfeited are reported to the Board of Trustees for re-appraisalment, before they are again offered in the market. The two quarter sections transferred from the Sioux City agency have been leased, one at \$10.75-100 per acre, the other at \$5.00 per acre. A full statement of the management of the agency has been given in detail, and will be found in the testimony reported by the Joint Committee of Investigation, appointed in the year 1874, to examine the affairs of the College, on page 755 of their published report.

The following books have been kept by me: A register of lands showing by ruled columns the number of lease, description of land,

price per acre, name of lessee, and date of lease. A register of leases showing in like manner the number of lease, description of land, price per acre, total value of tract leased, name of lessee, date of lease and payments made, together with the number of the receipts issued on such payments. A journal, showing each payment, date thereof, number of lease upon which the payment is made, number of receipt issued for same, name of person paying and amount, and a receipt-book showing number of receipt, date, amount, number of lease, description of land and time for which payment is made. These receipts are executed in duplicate, one being given to the payer, and the duplicate being retained in my office. Also, a similar receipt-book for Endowment Fund, and a plat book. A record is also kept of forfeited lands, and patented lands. I report quarterly to the Secretary of the Board of Trustees, transmitting exact copies of my accounts, so that duplicates of my books may be found in the office of such Secretary.

I report monthly to the Treasurer, transmitting all the funds in my hands, for which I receive duplicate receipts, one to be filed with the Secretary, and one to be filed in my office. I receive Endowment Fund, executing to the person so paying, a certificate of final payment, and retaining a duplicate of the same in my office, and obtaining from the President and Secretary a certificate of purchase, which is transmitted to the Treasurer of the College with the purchase money, and receive from the Register of the State Land Office a patent to be delivered to the purchaser.

I know of no way to simplify these accounts, consistent with perfect accuracy, and the existing laws and orders of the Board. In addition to these labors, a very considerable amount of work is required in conducting the correspondence with the lessees, in furnishing them information in reference to the location and quality of the land desired, from my personal knowledge, and in providing them with plats and lists of lands, with price and terms.

Accompanying the report will be found a duplicate statement of rents received and paid over for the years 1874 and 1875. Also, a report of Endowment Fund received and paid over. A statement of the land grant, showing number of acres patented, number undisposed of, and number now held by lease. Also a tabular statement of lands leased since last Biennial Report. Also a list of forfeited lands for re-appraisement, and printed list of unsold lands and appraised valuation. All of which is respectfully submitted.

(Signed)

GEO. W. BASSETT, *Agent.*

To the Board of Trustees of the Iowa Agricultural College:

The following report of the Land Department of the College from December 31, 1873, to October 31, 1875, is hereby submitted for your consideration.

During the year 1874, interest has been collected and paid over to the Treasurer as follows:

First quarter, ending March 31, 1874, collected.....	\$ 6,604.50	
Second quarter, ending June 30, 1874, collected.....	6,008.87	
Third quarter, ending September 30, 1874, collected.....	9,259.40	
Fourth quarter, ending December 31, 1874, collected.....	7,484.65	
Feb. 2. Paid Treasurer, voucher No. 46.....	\$ 4,185.62	
Mar. 5. Paid Treasurer, voucher No. 47.....	1,626.88	
Mar. 31. Paid Treasurer, voucher No. 48.....	792.00	
Apr. 30. Paid Treasurer, voucher No. 49.....	1,171.16	
June 2. Paid Treasurer, voucher No. 50, less ex.	2,704.04	
June 30. Paid Treasurer, voucher No. 51.....	2,134.67	
Aug. 1. Paid Treasurer, voucher No. 52.....	4,440.79	
Sept. 1. Paid Treasurer, voucher No. 53.....	2,488.57	
Oct. 1. Paid Treasurer, voucher No. 54.....	2,329.04	
Nov. 2. Paid Treasurer, voucher No. 55.....	2,111.17	
Dec. 1. Paid Treasurer, voucher No. 56.....	1,286.16	
Dec. 31. Paid Treasurer, voucher No. 57.....	4,087.32	
	<hr/>	
	\$29,357.42	\$29,357.42

From January 1, 1875, to October 31, 1875, interest has been collected and paid over to the Treasurer as follows:

First quarter, ending March 31, 1875, collected.....	\$ 5,117.01	
Second quarter, ending, June 30, 1875, collected.....	7,193.07	
Third quarter, ending Sept. 30, 1875, collected.....	11,955.70	
For the month of October.....	3,958.49	
Feb. 27. Paid Treasurer, voucher No. 58, less ex.	\$ 2,919.48	
Mar. 31. Paid Treasurer, voucher No. 59, less ex.	2,197.53	
May 4. Paid Treasurer, voucher No. 60.....	1,768.56	
June 1. Paid Treasurer, voucher No. 61.....	1,913.55	
June 30. Paid Treasurer, voucher No. 62.....	3,510.96	
Aug. 2. Paid Treasurer, voucher No. 63.....	4,082.40	
Aug. 30. Paid Treasurer, voucher No. 64.....	3,380.70	
Sept. 30. Paid Treasurer, voucher No. 65.....	4,492.60	
Oct. 30. Paid Treasurer, voucher No. 66.....	3,958.49	
	<hr/>	
	\$28,224.27	\$28,224.27

During the time included in this report, Endowment fund has been collected and paid over to the Treasurer as follows :

April 30, 1874, collected.....	\$ 400.00
June 30, 1874, collected.....	180.00
Dec. 31, 1874, collected.....	2,320.00
Mar. 31, 1875, collected.....	2,234.04
May 31, 1875, collected.....	3,767.80
June 30, 1875, collected.....	4,106.94
July 31, 1875, collected.....	7,218.00
Aug. 31, 1875, collected.....	9,362.01
Sept. 30, 1875, collected.....	2,974.50
Oct. 30, 1875, collected.....	8,248.95

April 30. Paid to Treasurer, voucher No. 16...	\$ 400.00
June 30. Paid to Treasurer, voucher No. 17...	180.00
Jan. 5,'75. Paid to Treasurer, voucher No. 18...	2,320.00
Mar. 31. Paid to Treasurer, voucher No. 19...	2,234.04
June 1. Paid to Treasurer, voucher No. 20...	3,767.80
June 2. Paid to Treasurer, voucher No. 21...	200.00
June 8. Paid to Treasurer, voucher No. 22...	779.44
June 30. Paid to Treasurer, voucher No. 23...	3,127.50
Aug. 6. Paid to Treasurer, voucher No. 24...	7,218.00
Sept. 9. Paid to Treasurer, voucher No. 25...	9,362.01
Sept. 30. Paid to Treasurer, voucher No. 26...	2,974.50
Oct. 30. Paid to Treasurer, voucher No. 27...	8,248.95

\$40,812.24 \$40,812.24

There were at date of last Biennial Report :

	<i>Acres.</i>
Forfeited lands not disposed of.....	22,765.17
Forfeited since said report	23,864.31
Transferred from Sioux City district.....	320.00

46,949.48

No. of acres leased since said Biennial Report.....	15,628.14
No. of acres undisposed of.....	31,321.34

46,949.48

No. of acres patented prior to Dec. 31, 1873.....	5,487.35
No. of acres patented from Dec. 31, 1873, to Oct. 31, 1875...	17,518.12

Total No. acres patented..... 23,005.47

No. of acres of the original college grant first placed under my charge	204,206.36
Transferred from Sioux City department.....	320.00
	204,526.36

No. of acres patented.....	23,005.47
No. of acres undisposed of.....	31,321.34
No. of acres under leases in force.....	150,199.55
	204,526.36

Accompanying this report is a tabular statement of the lands leased since the last Biennial Report of Dec. 31, 1873, and up to Oct. 31, 1875.

List of Lands Forfeited October 20th, 1875, and Re-appraised by Board of Trustees November 15th, 1875.

No. lease.	Part section.	Section.	Township.	Range.	Acres.	Former price.	Re-appraise- ment.	Remarks.
560	ne qr	15	96	31	160	\$2.25	\$4.00	.....
561	nw qr	15	96	31	160	2.25	4.00	.....
562	se qr	15	96	31	160	2.25	4.00	.....
563	sw qr	15	96	31	160	2.25	4.00	.....
1125	ne qr	33	95	27	160	3.00	4.00	.....
1126	sw qr	34	95	27	160	3.00	4.00	.....
1316	sw qr	23	94	28	160	4.20	4.00	.....
1443	ne qr	4	94	36	140.79	3.40	4.00	.....
1470	sw qr	13	100	36	160	4.00	4.00	.....
1478	ne qr	28	93	36	160	7.00	5.00	.....

FORFEITED NOVEMBER 10, 1875.

445	sw qr	28	96	31	160	\$2.25	\$4.00	.....
446	se qr	28	96	31	160	2.25	4.00	.....
476	sw qr	29	97	30	160	2.25	4.00	.....
710	se qr	5	96	31	160	2.25	5.00	.....
1051	ne qr	22	94	39	160	2.25	3.50	.....
1052	se qr	22	94	39	160	2.25	3.50	.....
1144	se qr	28	99	48	160	2.25	3.50	.....
1166	ne qr	24	94	39	160	2.25	3.50	.....
1171	nw qr	2	86	41	164.23	3.75	5.00	.....

ABSTRACT OF SALES, IOWA AGRICULTURAL COLLEGE LANDS.

No. of Entry.	PART OF SECTION.	Section.	Township.	Range.	QUANTI- TY.		PRICE PER ACRE.	TOTAL VALUE.		NAME OF PURCHASER OR LESSEE.	DATE OF PUR- CHASE OR LEASE.			First pay- ment of in- terest.	Fee.
					A- cres.	100ths.		Dol. Cts.	Dol. Cts.		Month	Day.	Year.		
1481 SW qr.	28	87	38	160.00		\$ 5.00	\$ 800.00		H. C. Wheeler.....	April	13	1874	61.00	14.00
1482 NW qr.	14	90	46	160.00		6.00	960.00		Henry Rademacher.....	May	13	1874	76.80	14.00
1483 NW qr.	14	90	45	160.00		6.00	960.00		Fredericke Mucke.....	May	13	1874	76.80	14.00
1484 SW qr.	36	88	41	160.00		6.00	960.00		Peter P. Fuglesang.....	May	22	1874	70.80	14.00
1485 SW qr.	36	87	38	160.00		5.00	800.00		C. H. Leroy.....	July	1	1874	61.00	14.00
1486 N hf of ne qr.	26	90	47	80.00		5.00	400.00		Henry Barrett.....	October	15	1874	32.00	14.00
1487 SW qr.	14	95	27	160.00		3.50	560.00		J. B. Williams.....	February	1	1875	41.80	14.00
1488 NE qr.	12	90	41	160.00		10.75	1720.00		Martha A. Barnard.....	"	"	"	137.60	14.00
1489 SE qr.	12	90	41	160.00		5.00	800.00		A. J. Clark.....	"	"	"	61.00	14.00
1490 NE qr.	32	95	27	160.00		3.00	480.00		J. Fuller.....	"	"	"	38.40	14.00
1491 NW qr.	32	95	27	160.00		3.00	480.00		H. P. Walker.....	"	"	"	38.40	14.00
1492 SE qr.	29	95	27	160.00		3.00	480.00		G. F. Peterson.....	"	"	"	38.40	14.00
1493 SW qr.	29	95	27	160.00		3.00	480.00		I. B. Scott.....	"	"	"	38.40	14.00
1494 NE qr.	34	95	27	160.00		3.00	480.00		D. A. Miller.....	March	6	1875	38.40	14.00
1495 SE qr.	34	95	27	160.00		3.00	480.00		S. Sherman.....	"	6	1875	38.40	14.00
1496 NW qr.	35	95	27	160.00		3.00	480.00		J. Walz.....	"	6	1875	38.40	14.00
1497 SW qr.	35	95	27	160.00		3.00	480.00		W. H. Ginn.....	"	"	"	38.40	14.00
1498 SW qr.	27	95	27	160.00		3.00	480.00		P. Chantland.....	"	"	"	40.48	14.00
1499 NW qr.	31	95	27	164.52		3.00	493.56		N. Connors.....	April	23	1875	38.48	14.00
1500 SE qr.	31	95	27	160.00		3.00	480.00		I. B. Johnson.....	"	14	1875	38.48	14.00
1501 SW qr.	21	95	27	168.84		3.00	506.52		I. W. Harden.....	"	14	1875	38.40	14.00
1502 SW qr.	25	95	27	160.00		3.00	480.00		P. Baller.....	"	"	"	40.00	14.00
1503 N Wqr.	12	87	41	160.00		3.75	600.00		P. Fuglesong.....	"	"	"	38.40	14.00
1504 NE qr.	28	99	33	160.00		4.00	640.00		C. Read.....	"	21	1875	48.00	14.00
1505 NE qr.	26	95	27	160.00		3.00	480.00		O. B. Wyman.....	"	"	"	51.20	14.00
1506 SE qr.	36	87	41	160.00		3.75	600.00		G. W. Ritz.....	May	8	1875	38.40	14.00
1507 SE qr.	36	92	40	160.00		8.00	1280.00		H. A. Olmstead.....	"	11	1875	48.00	14.00
1508 SE qr.	12	96	34	160.00		2.75	440.00		R. E. Orwsby.....	June	19	1875	102.40	14.00
1509 NE qr.	12	96	34	160.00		2.75	440.00		Mary A. Orwsby.....	"	1	1875	35.20	14.00
1510 NE qr.	18	97	32	160.00		2.75	440.00		E. S. Orwsby.....	"	"	"	48.00	14.00
1511 SE qr.	18	97	32	160.00		5.00	800.00		A. L. Orwsby.....	"	"	"	61.00	14.00
1512 NE qr.	36	95	27	160.00		3.00	480.00		I. W. Chantland.....	"	"	"	38.40	14.00
1513 NW qr.	36	95	27	160.00		3.00	480.00		J. T. Chantland.....	"	"	"	38.40	14.00
1514 SW qr.	4	87	40	160.00		4.00	640.00		J. S. Laney.....	"	7	1875	51.20	14.00
1515 SE qr.	26	95	27	160.00		3.00	480.00		J. Haile.....	"	8	1875	38.40	14.00
1516 NW qr.	30	87	41	131.32		3.75	492.45		Frank Burns.....	"	11	1875	39.40	14.00
1517 NE qr.	24	88	41	160.00		4.50	720.00		S. M. Eldridge.....	"	16	1875	57.60	14.00

ABSTRACT OF SALES, IOWA AGRICULTURAL COLLEGE LANDS.—CONTINUED.

No. of Entry.	PART OF SECTION.	Section.	Township.	Range.	QUANTI- TY.		PRICE PER ACRE.		TOTAL VALUE.		NAME OF PURCHASER OR LESSEE.	DATE OF PUR- CHASE.			F i r s t p a y- ment of In- terest.	Fee.		
					Acres.	100ths.	Dol.	Cts.	Dol.	Cts.		Month.	Day.	Year.				
1518 ne qr		24	88	41	160.00		4.50		720.00		B. S. Eldridge	June	16	1875	57.60	14.00		
1519 se qr		8	86	41	160.00		6.00		960.00		Charles F. Guyer	"	"	21	1875	76.80	14.00	
1520 se qr		8	86	41	160.00		6.00		960.00		J. W. Guyer	"	"	"	21	1875	76.80	14.00
1521 sw qr		34	97	34	160.00		2.75		440.00		W. N. Shea	"	"	28	1875	35.20	14.00	
1522 ne qr		8	88	41	160.00		3.00		480.00		S. W. Young	July	"	"	1	1875	38.40	14.00
1523 se qr		14	90	37	160.00		5.00		800.00		John Carraher	"	"	8	1875	64.00	14.00	
1524 ne qr		14	86	42	160.00		3.75		600.00		Samuel Hannan	Aug	"	"	2	1875	48.00	14.00
1525 nw qr		14	86	42	160.00		3.75		600.00		A. S. Halbet	"	"	"	2	1875	48.00	14.00
1526 sw qr		14	86	42	160.00		3.75		600.00		Peter Gable	"	"	"	2	1875	48.00	14.00
1527 se qr		14	86	42	160.00		3.75		600.00		John A. Coy	"	"	"	2	1875	48.00	14.00
1528 ne qr		10	86	42	160.00		3.75		600.00		Irus Coy	"	"	"	2	1875	48.00	14.00
1529 se qr		10	86	42	160.00		3.75		600.00		H. P. Coy	"	"	"	2	1875	48.00	14.00
1530 sw qr		30	87	41	132.52		8.75		496.95		R. H. Campbell	"	"	"	6	1875	39.75	14.00
1531 se qr		26	99	33	160.00		3.50		500.00		S. A. Ballard	"	"	"	6	1875	41.80	14.00
1532 sw qr		4	91	40	169.62		5.00		800.00		Carlton Corbett	"	"	"	6	1875	64.00	14.00
1533 nw qr		4	91	40	169.62		5.00		848.10		F. E. Whitmore	"	"	"	6	1875	67.84	14.00
1534 ne qr		26	90	33	160.00		3.50		560.00		E. N. Ballard	"	"	"	10	1875	44.80	14.00
1535 nw qr		4	88	41	226.55		3.50		792.92		W. P. Evans	"	"	"	13	1875	63.43	14.00
1536 nw qr		36	87	41	160.00		4.00		640.00		George T. Williams	"	"	"	14	1875	51.20	14.00
1537 ne qr		32	87	41	160.00		3.75		600.00		E. Bates	"	"	"	19	1875	48.00	14.00
1538 ne qr		36	96	34	160.00		3.50		560.00		Wm. Bean	"	"	"	19	1875	41.80	14.00
1539 nw qr		8	94	32	160.00		3.50		560.00		Mary J. Whitehill	"	"	"	19	1875	41.80	14.00
1540 ne qr		21	99	33	160.00		3.50		560.00		J. N. Waters	"	"	"	20	1875	44.80	14.00
1541 nw qr		21	99	33	160.00		3.50		560.00		D. Fesler	"	"	"	20	1875	44.80	14.00
1542 ne qr		35	98	27	160.00		3.00		480.00		G. Paternd.	"	"	"	20	1875	38.40	14.00
1543 se qr		32	97	27	160.00		3.00		480.00		C. Long	"	"	"	20	1875	38.40	14.00
1544 ne qr		32	94	32	160.00		3.50		560.00		Rochel Lindley	"	"	"	23	1875	44.80	14.00
1545 nw qr		32	94	32	160.00		3.50		560.00		B. F. Lindley	"	"	"	23	1875	44.80	14.00
1546 se qr		32	94	32	160.00		3.50		560.00		W. A. Lindley	"	"	"	23	1875	44.80	14.00
1547 sw qr		32	94	32	160.00		3.50		560.00		D. Lindley	"	"	"	23	1875	44.80	14.00
1548 se qr		20	94	33	160.00		3.50		560.00		Jennie Lindley	"	"	"	23	1875	44.80	14.00
1549 nw qr		28	93	36	160.00		4.50		720.00		Mary A. Thomas	Sept	"	"	1	1875	57.60	14.00
1550 w hf of sw qr		36	87	41	80.00		4.00		320.00		Thomas C. Calvert	"	"	"	1	1875	25.60	14.00
1551 ne qr		31	95	33	160.00		3.50		560.00		John D. Hall	"	"	"	18	1875	41.80	14.00
1552 se qr		31	95	33	160.00		3.50		560.00		T. Cummins	"	"	"	18	1875	41.80	14.00
1553 se qr		32	95	33	160.00		3.50		560.00		John Bennett	"	"	"	18	1875	41.80	14.00
1554 nw qr		28	88	41	160.00		4.00		640.00		A. McGinnis	"	"	"	23	1875	51.20	14.00
1555 nw qr		2	87	41	156.77		4.00		627.08		M. Burk	"	"	"	23	1875	50.16	14.00

1555 ne qr.....	12	87	41	160.00	3.75	600.00	W. L. Simmons.....	23 1875	48.00	14.00
1557 ne qr.....	30	87	41	160.00	3.75	600.00	H. N. Woodard.....	" 23 1875	48.00	14.00
1558 nw qr.....	32	87	41	160.00	4.00	640.00	I. M. Hay.....	" 23 1875	51.20	14.00
1559 ne qr.....	14	88	42	160.00	2.25	360.00	Jefferson Shults.....	" 23 1875	28.80	14.00
1560 sw qr.....	34	86	42	160.00	4.00	640.00	O. C. Ainsworth.....	" 23 1875	51.20	14.00
1561 se qr.....	14	89	43	160.00	4.00	640.00	W. H. Lewis.....	" 23 1875	51.20	14.00
1562 sw qr.....	14	89	43	160.00	4.00	640.00	George P. Hay.....	" 23 1875	51.20	14.00
1563 sw qr.....	28	88	45	160.00	4.00	640.00	O. S. Nendee.....	" 23 1875	51.20	14.00
1564 se qr.....	34	86	42	160.00	4.00	640.00	Thomas Wright.....	" 23 1875	51.20	14.00
1565 ne qr.....	13	94	28	160.00	4.00	640.00	F. Nance.....	" 23 1875	51.20	14.00
1566 nw qr.....	14	94	28	160.00	4.00	640.00	D. Musolf.....	" 23 1875	51.20	14.00
1567 ne qr.....	24	94	28	160.00	4.00	640.00	C. S. Blanchard.....	" 23 1875	51.20	14.00
1568 sw qr.....	24	94	28	160.00	4.00	640.00	D. Benka.....	" 23 1875	51.20	14.00
1569 ne qr.....	25	94	28	160.00	4.00	640.00	M. Bigey.....	" 23 1875	51.20	14.00
1570 se qr.....	25	94	28	160.00	4.00	640.00	J. Stacey.....	" 23 1875	51.20	14.00
1571 se qr.....	26	94	28	160.00	4.00	640.00	John Tiende.....	" 23 1875	51.20	14.00
1572 nw qr.....	36	94	28	160.00	4.00	640.00	J. B. Jones.....	" 23 1875	51.20	14.00
1573 sw qr.....	11	97	48	160.00	3.50	560.00	N. M. Hendricks.....	" 23 1875	51.20	14.00
1574 ne qr.....	23	97	30	160.00	4.00	640.00	J. N. Hawkins.....	" 27 1875	44.80	14.00
1575 nw qr.....	23	97	30	160.00	4.00	640.00	J. E. Stacey.....	" 15 1875	51.20	14.00
1576 nw qr.....	32	97	30	160.00	3.50	560.00	H. A. Wilcox.....	" 15 1875	51.20	14.00
1577 sw qr.....	32	97	30	160.00	3.25	520.00	John H. Taylor.....	" 15 1875	41.80	14.00
1578 w hf of se qr.....	32	97	30	80.00	3.25	260.00	J. H. Jones.....	" 15 1875	41.60	14.00
1579 se qr.....	35	97	27	160.00	3.00	480.00	A. P. Haynes.....	" 30 1875	20.80	14.00
				14,748.14						

Leased during the year 1874.....

Leased from December 31, 1874, to October 31, 1875.....

880.00 acres.

14,748.14 acres.

Total.....

15,628.14

REPORT OF SUPERINTENDENT OF PHYSICAL LABORATORY BUILDING, IOWA STATE AGRICULTURAL COLLEGE.

To The Board of Trustees :

GENTLEMEN :—Under an act of the 15th General Assembly of the State of Iowa, entitled “An Act making an Appropriation for erecting a Physical Laboratory Building for the Agricultural College and Farm,” approved March 19th, 1874, I was appointed, on the 2nd of July, 1874, by an order of your Board, to superintend the building of the same, and to act as agent of the Board in the disbursement of the money appropriated in the act aforesaid.

At the date of my appointment, the contract for erecting said building was awarded to Hugh Brown, of Iowa City, for the sum of \$13,500.00, in accordance with plans and specifications by R. S. Finkbine, architect, approved by the Board.

By a provision of the act, only \$15,000.00 could be expended in the year 1874. At your January meeting in 1875, I made an itemized report of the expenditures of 1874, amounting to \$12,023.64, and the progress of the work.

On the 15th day of June, 1875, Hugh Brown completed his contract, with such changes as were recommended by your Board and the architect. The building was accepted by me on the same date, in accordance with your order of June 10th, 1875.

In addition to the contract aforesaid, made with Hugh Brown, another contract was entered into by the Board, with said Brown, for building a portico and stone steps for the front of the building, on the 14th of November, for the sum of 1,100.00, in accordance with the plans and specifications submitted by R. S. Finkbine, architect. The latter contract was completed July 10th, 1875, and payment made for the same in full.

At your meeting, in November, 1874, Professor A. Thompson was authorized to purchase and put in steam boiler and heating apparatus, and to employ help in arranging furniture and fixtures in Laboratory Building, the expenditures for which were to be supervised by me, as per your order of January 15th, 1875.

Under your orders aforesaid, the building is completed and well protected; the machinery, furniture and fixtures all arranged; payments made in full for all the work, and the building is now ready for use.

There is still on hand through over-estimate, 23,500 bricks which I recommend should be sold and the proceeds applied to the payment of any change or improvement that, in the future may be deemed necessary for the Laboratory building.

Of the \$25,000.00 appropriated by the Legislature, \$24,850.00 have been expended, leaving a balance unexpended and not drawn from the State Treasury of \$150.00.

I herewith submit an itemized statement of receipts and disbursements on account of Physical Laboratory building marked A, and made a part of this report. Duplicate receipts have been taken and forwarded to the Auditor of State, as required by the act aforesaid, the original receipts being retained in the office of the College Treasurer.

RECAPITULATION OF EXPENDITURES.

First contract with H. Brown.....	\$13,500.00
Extras allowed for changes by the Board.....	1,199.38
Portico and stone steps.	1,100.00
<hr/>	
Total for building.....	\$15,799.38
Expended on internal arrangements.....	7,532.12
Superintendent's per diem and expenses.....	1,234.00
Plans, specifications and advertising.....	284.50
<hr/>	
Total expended.....	\$24,850.00
Balance not drawn from State Treasury.....	150.00
<hr/>	
Total appropriation.....	\$25,000.00

I again reiterate what I said in my report at your January meeting, that Mr. Hugh Brown is entitled to credit for the faithful performance of his contract, he having finished the building in a substantial and workman-like manner. I would also say of Professor A. Thompson, that in the supervision of the building, he has exhibited much skill and good taste in such work.

Respectfully submitted.

LAUREL SUMMERS,

Superintendent of Physical Laboratory Building.

Ames, Iowa, Nov. 9, 1875.

EXHIBIT "A."

NEW PHYSICAL LABORATORY BUILDING ACCOUNT, NOV., 1875.

DATE.	AMOUNT RECEIVED.	AM'T.
1874.		
July 14	By amount from State Treasurer, on estimate.....	\$ 1,136.50
Sept. 5	By amount from State Treasurer, on estimate.....	5,188.86
Oct. 10	By amount from State Treasurer, on estimate.....	2,536.00
Nov. 6	By amount from State Treasurer, on estimate.....	2,391.00
Dec. 7	By amount from State Treasurer, on estimate.....	1,071.50
1875.		
Feb. 17	By amount from State Treasurer, on estimate.....	1,427.33
Mar. 16	By amount from State Treasurer, on estimate.....	3,639.50
May 10	By amount from State Treasurer, on estimate.....	1,287.46
June 18	By amount from State Treasurer, on estimate.....	1,000.00
June 24	By amount from State Treasurer, on estimate.....	1,000.00
July 21	By amount from State Treasurer, on estimate.....	1,500.00
Oct. 2	By amount from State Treasurer, on estimate.....	2,601.85
Total.....		\$24,850.00

DATE.	Vouchers.	TO WHOM PAID.	AM'T.
1874.			
July 14	1	To paid J. J. McDougall, on brick.....	\$ 500.00
July 22	2	To paid H. N. Tupper, for stone.....	125.00
July 24	3	To paid State Register, for advertising.....	15.00
July 24	4	To paid Ham & Carver, for advertising.....	12.00
July 24	5	To paid J. M. Hendrick & Co., for advertising.....	7.50
July 28	6	To paid R. S. Finkbine, for plans.....	250.00
Aug. 24	7	To paid H. N. Tupper, for stone.....	30.00
Aug. 24	8	To paid Geo. Roe, for excavating stone.....	11.80
Aug. 26	9	To paid J. J. McDougall, on brick.....	185.20
Sept. 7	10	To paid L. Summers, for services as Supt.....	210.00
Sept. 7	11	To paid Hugh Brown's estimate for August.....	2,957.04
Sept. 7	12	To paid J. J. McDougall, for brick.....	1,000.00
Oct. 8	13	To paid J. J. McDougall, for brick.....	500.00
Oct. 12	14	To paid Hugh Brown's estimate for September.....	1,987.50
Oct. 12	15	To paid L. Summers, for services as Supt.....	130.00
Nov. 7	16	To paid Hugh Brown's estimate for October.....	1,807.10
Nov. 16	17	To paid Hugh Brown, 15 per cent. of \$7,954.86.....	1,193.22
Nov. 16	18	To paid J. J. McDougall.....	16.50
Nov. 16	19	To paid L. Summers, for services as Supt.....	175.00
Dec. 10	20	To paid Hugh Brown's estimate for November.....	910.78
1875.			
Jan. 16	21	To paid H. N. Tupper, for balance on stone.....	2.50
Jan. 16	22	To paid Nichols, for hauling brick.....	5.00
Jan. 16	23	To paid freight on fire-brick.....	1.25
Jan. 16	24	To paid J. J. McDougall, part payment on brick.....	70.00
Feb. 8	25	To paid R. B. Shearer, for labor.....	14.25
Feb. 8	26	To paid A. Thompson's expenses to Chicago.....	41.15
Feb. 8	27	To paid express on fittings.....	1.30
Feb. 8	28	To paid B. F. Crow, for labor.....	8.48
Feb. 13	29	To paid freight bills.....	124.90
Feb. 17	30	To paid Chas. McCall, for labor.....	25.37
Feb. 17	31	To paid G. W. McCall, for labor.....	34.67
Feb. 17	32	To paid John Wood, for labor.....	14.95
Feb. 17	33	To paid John Reynolds, for labor.....	14.17
Feb. 17	34	To paid Frank Douglass & Co., for heating apparatus.....	671.00
Feb. 17	35	To paid Crane Bros., for apparatus and fittings.....	693.64
Feb. 20	36	To paid freight bills on steam heater.....	4.25
Feb. 20	37	To paid Lamb & Sons, bill of lumber.....	88.20
Mar. 17	38	To paid Hugh Brown, on estimate.....	1,500.00

EXHIBIT "A."—CONTINUED.

DATE.	Vouchers.	TO WHOM PAID.	AM'T.
1875.			
Mar. 12	39	To paid freight on registers.....	2.02
Mar. 20	40	To paid Frank Douglass & Co's bill.....	142.25
Mar. 30	41	To paid Hugh Brown, for labor and material.....	425.25
Mar. 31	42	To paid S. A. Robertson, for fire-brick.....	12.00
April 1	43	To paid Wm. Kingsbury, for walnut lumber.....	249.06
April 1	44	To paid Crane Bros. Manfg Co's. bill.....	136.88
April 1	45	To paid Hutchison Bros., for coal.....	5.85
April 6	46	To paid freight bills.....	6.82
April 6	47	To paid freight bills.....	6.31
April 6	48	To paid L. Summers, for services as Supt.....	145.00
May 17	49	To paid Hugh Brown's estimate for March and April.....	850.00
May 17	50	To paid L. Summers, for services as superintendent.....	45.03
June 1	51	To paid A. Thompson, for work by College Workshop.....	188.44
June 1	52	To paid A. S. Welch, for work by College Workshop.....	134.47
June 1	53	To paid Crane Bros. Manfg. Co.'s bill.....	187.46
June 9	54	To paid Hugh Brown, for labor.....	36.31
June 9	55	To paid Hugh Brown, for labor and material.....	7.50
June 9	56	To paid Hugh Brown, for labor and material.....	26.10
June 15	57	To paid J. J. McDougall, for brick.....	41.80
June 15	58	To paid J. J. McDougall, interest on money.....	6.66
June 15	59	To paid Freight on chairs for rooms.....	13.07
June 15	60	To paid College Workshop, for labor.....	80.66
June 17	61	To paid Boyd Bros.' bill.....	29.88
June 17	62	To paid A. H. Andrews, for bill of chairs.....	264.00
June 17	63	To paid H. Nichols, bill for hauling.....	2.00
June 19	64	To paid J. Hutchinson Bros., for coal.....	200.23
June 17	65	To paid Hugh Brown, for work and material.....	798.49
June 17	66	To paid L. Summers, for services as superintendent.....	110.00
June 28	67	To paid Hugh Brown, for labor and material.....	700.00
July 12	68	To paid Hugh Brown, for labor and material.....	400.00
July 26	69	To paid Van Dusen, for grading.....	4.00
July 27	70	To paid Crane Bros.' bill.....	61.69
July 29	71	To paid College Workshop, for labor and material.....	693.54
July 31	72	To paid L. Summers, for services as superintendent.....	185.00
July 31	73	To paid Hugh Brown, for work.....	4.50
Aug. 17	74	To paid Crane Bros.' bill.....	52.61
Aug. 17	75	To paid Lamb & Sons, bill of lumber.....	22.90
Aug. 17	76	To paid Lamb & Sons, bill of lumber.....	76.95
Oct. 1	77	To paid Geo. Pitson, for plastering.....	17.00
Oct. 2	78	To paid L. Summers, for services as superintendent.....	110.00
Oct. 2	79	To paid Frank Douglass Machinery Co.....	133.44
Oct. 2	80	To paid Lamb & Sons, for lumber.....	67.40
Oct. 9	81	To paid College Workshop, for work and material.....	566.53
Oct. 9	82	To paid Starr, Brenneman & Lucas.....	34.75
Oct. 9	83	To paid College Farm teams, for work.....	2.85
Oct. 20	84	To paid Crane Bros.' Manfg. Co.....	32.34
Oct. 30	85	To paid Frank Douglas Machinery Co.....	1,205.50
Oct. 30	86	To paid Kirkwood & Dunklee.....	127.02
Nov. 2	87	To paid L. Summers, for services as superintendent.....	54.00
Nov. 2	88	To paid Freight bills on machinery.....	99.67
Nov. 4	89	To paid A. Thompson's expenses.....	19.00
Nov. 5	90	To paid Freight bill.....	11.36
Nov. 5	91	To paid Frank Douglass Machinery Co.....	224.25
Nov. 5	92	To paid C. Lamb & Sons' bill.....	29.40
Nov. 5	93	To paid Starr, Brenneman & Lucas.....	11.92
Nov. 6	94	To paid College Workshop, for labor and material.....	340.65
Nov. 9	95	To paid L. Summers, for services as superintendent.....	70.00
			<u>\$24,850.00</u>

SUMMARY.

	DR.	CR.
By amount appropriated by Fifteenth General Assembly.....		\$25,000.00
To amount expended on Laboratory building.....	\$24,850.00	
By amount in State Treasury not drawn.....	150.00	
	<u>\$25,000.00</u>	<u>\$25,000.00</u>

REPORT OF THE TREASURER.

Statement of Accounts for the Fiscal Year ending November 11, 1875.

ITEMS.	DR.	CR.	DR.	CR.
Current expenses of the College.....	\$ 18,554.21	\$	\$ 24,333.82	.....
Salaries.....	2,041.66	.....	.....	.....
Contingent expenses.....	52.85	.....	.....	.....
Apiary.....	129.68	.....	.....	.....
Museum.....	649.53	.....	.....	.....
Ornamental grounds.....	458.72	.....	.....	.....
Library.....	483.50	.....	.....	.....
Workshop.....	1,847.34	.....	.....	.....
Fires and lights.....	116.03	.....	.....	.....
Military Department.....	24,333.82	.....	.....	.....
Department of Physics.....	.....	.....	443.14	.....
Physical laboratory.....	156.60	.....	.....	.....
Philosophical apparatus.....	286.54	.....	.....	.....
.....	443.14	.....	.....	.....
Department of Chemistry.....	.....	.....	187.14	.....
Chemical laboratory.....	187.14	.....	.....	.....
Department of Botany and Entomology.....	123.45	.....	123.45	.....
Department of Horticulture and Forestry.....	.....	.....	821.07	.....
Horticulture and forestry.....	193.76	.....	.....	.....
Permanent improvements.....	.15	.....	.....	.....
Garden hot beds.....	.15	.....	.....	.....
Garden vegetables.....	131.28	.....	.....	.....
Nursery.....	35.19	.....	.....	.....
Hedge.....	13.01	.....	.....	.....
Vineyard.....	33.64	.....	.....	.....
Small fruits.....	68.89	.....	.....	.....
Forestry.....	205.86	.....	.....	.....
Orchard.....	137.48	.....	.....	.....
Horticultural experiments.....	1.66	.....	.....	.....
.....	821.07	.....	.....	.....
Department of Agriculture—	.....	.....	.....	.....
Farm inventory.....	1,390.44	.....	.....	.....
Farm products.....	362.92	.....	.....	.....
Farm experiments.....	42.12	.....	.....	.....
Farm improvements.....	824.97	.....	.....	.....
Farm tools.....	276.00	.....	.....	.....
Farm potato field.....	.....	49.87	.....	.....
Farm hay field.....	.....	347.25	.....	.....
Farm rye field.....	.....	40.89	.....	.....
Farm oat field.....	.....	163.65	.....	.....
Farm root field.....	.....	82.21	.....	.....
Farm corn field of 1873.....	.....	945.12	.....	.....
Farm wheat field.....	.....	32.98	.....	.....
Farm corn field of 1874.....	.....	929.56	.....	.....
Farm stock.....	.....	1,036.07	.....	.....
Farm teams.....	.....	269.24	.....	.....
Farm household.....	.....	372.65	.....	.....
.....	2,896.45	4,269.49	.....	.....
Gain of farm for the year.....	1,373.01	.....	.....	.....
Inventory—	.....	.....	.....	.....
Inventory of 1873.....	.....	7,320.52	.....	.....
Inventory of 1874.....	8,658.91	.....	.....	.....
By balance increase of inventory.....	.....	.....	1,338.39	.....
.....	.....	.....	27,247.61	.....

STATEMENT OF ACCOUNTS.—CONTINUED.

ITEMS.	DR.	CR.	DR.	CR.
Interest Fund—	\$	\$	\$	\$
Balance from last year.....		851.69		
Amount expended as above.....	27,247.01			
Amount received from G. W. Bassett.....		28,701.81		
Amount transferred from Farm.....		1,373.04		
To balance amount unexpended.....	3,682.53			3,682.53
Contingent Fund—				
Balance from last year.....		1,580.49		
Amount received from T. J. Stone.....		2,028.80		
Amount expended.....	1,066.12			
To balance amount unexpended.....	2,543.17			2,543.17
Freight Drawbacks—				
Balance from last year.....		627.56		
Amount received from C. & N. W. R. R.....		324.07		
Amount expended.....	918.28			
To balance amount unexpended.....	33.35			33.35
Diplomas—				
Amount received from graduates.....		100.00		
Amount expended.....	20.90			
To balance amount unexpended.....	79.10			79.10
Interest—				
Balance from last year.....		109.06		
Amount expended.....	90.17			
Amount received on notes.....		48.71		
To balance amount unexpended.....	67.60			67.60
School Books—				
Balance from last year.....		72.77		
Amount received from sales.....		3,721.34		
Amount expended.....	3,744.77			
To balance amount unexpended.....	48.94			48.94
Laundry—				
Amount received for washing.....		1,191.32		
Amount expended.....	1,182.71			
To balance amount unexpended.....	8.61			8.61
Incidental expenses—				
Amount received from students and others.....		1,600.70		
Amount expended.....	1,529.95			
To balance amount unexpended.....	70.75			70.75
Bills receivable—				
Balance from last year.....	1,273.62			
Notes received.....	2,061.35			
Notes paid.....		578.35		
To balance.....			2,756.62	
Farm rye field of 1875.....	8.19			
Balance.....			8.19	
Boarding department—				
Amount expended.....	20,212.49			
Amount received.....		19,598.20		
By balance.....		614.29	614.29	
Personal accounts—				
Amount due from sundry persons.....	322.67		322.67	

STATEMENT OF ACCOUNTS.—CONTINUED.

ITEMS.	DR.	CR.	DR.	CR.
Cash—	\$	\$	\$	\$
Balance from last year.....	134.60	.....	.....	.....
Amount received from all sources.....	68,048.20	.....	.....	.....
Amount paid out, as per vouchers.....	.....	67,258.67	.....	.....
To balance cash on hand.....	.....	924.13	924.13	.....
College Endowment Fund—				
Amount received from Bassett and sent to State Treasurer.....	.....	400.00	.....	400.00
Gas Supply—				
Dr. balance.....	2,474.25	.....	2,474.25	.....
Appropriations—				
Seed Appropriation.....	.....	.....	.....	.....
Balance from last year.....	.....	205.50	.....	.....
Amount expended.....	36.65	.....	.....	.....
To balance, amount unexpended.....	168.85	.....	.....	168.85
Appropriations of 1868—				
Cr. balance from last year.....	.....	118.80	.....	118.80
College Extension—				
Cr. balance from last year.....	.....	63.52	.....	63.52
Fixtures for New Wing—				
Cr. balance from last year.....	.....	500.00	.....	500.00
Main Laboratory Building—				
Balance from last year.....	.....	792.31	.....	.....
Amount received from farm.....	.....	2.00	.....	.....
Amount expended.....	45.90	.....	.....	.....
To balance unexpended.....	748.41	.....	.....	748.41
Water Supply—				
Balance from last year.....	.....	154.69	.....	.....
Amount expended.....	104.62	.....	.....	.....
To balance unexpended.....	50.07	.....	.....	50.07
Physical Laboratory building—				
Amount received from State Treasurer.....	.....	11,252.36	.....	.....
Amount expended.....	11,112.86	.....	.....	.....
To balance amount unexpended.....	139.50	.....	.....	139.50
College furnace—				
Amount received from State Treasurer.....	.....	825.00	.....	.....
Amount expended.....	656.86	.....	.....	.....
To balance amount unexpended.....	168.14	.....	.....	168.14
College furnace piping—				
Amount received from State Treasurer.....	.....	150.00	.....	.....
Amount unexpended.....	.....	.....	.....	150.00
College hall matting—				
Amount received from State Treasurer.....	.....	40.00	.....	.....
Amount expended.....	38.78	.....	.....	.....
To balance amount unexpended.....	1.22	.....	.....	1.22
Farm-house bed-clothing—				
Amount received from State Treasurer.....	.....	20.00	.....	.....
Amount unexpended.....	.....	.....	.....	20.00
Farm-house painting—				
Amount received from State Treasurer.....	.....	28.00	.....	.....
Amount expended.....	26.55	.....	.....	.....
To balance amount unexpended.....	1.45	.....	.....	1.45
Farm improvement—				
Dr. balance from last year.....	1,963.86	.....	1,963.86	.....
	.....	.....	9,064.01	9,064.01

SUMMARY.

DR.		CR.	
Bills receivable.....	\$ 2,756.62	Freight drawbacks.....	\$ 33.85
Farm rye field 1875.....	8.19	Seed appropriation.....	168.85
Farm improvement appropria- tion	1,963.86	Appropriation of 1868.....	118.00
Gas supply.....	2,474.25	College extension.....	63.52
Board	614.29	Fixtures for new wing.....	500.00
Personal accounts.....	322.67	Main laboratory building.....	784.41
Cash on hand.....	924.13	Water supply.....	50.07
		Diplomas	79.10
		Contingent fund.....	2,543.17
		Interest	67.60
		Interest fund.....	3,682.53
		Endowment fund.....	400.00
		Furnace appropriation.....	168.14
		Furnace piping.....	150.00
		Hall matting.....	1.22
		Farm house bed clothing.....	20.00
		Farm-house painting.....	1.45
		Physical laboratory building.....	139.50
		School-books	48.94
		Laundry	8.61
		Incidental expenses.....	70.75
	\$9,064.01		\$9,064.01

STATEMENT OF APPROPRIATIONS EXPENDED AND ACCOUNTS CLOSED.

	DR.	CR.
Plastering appropriation— amount from State Treasury.....		\$ 200.00
amount expended	\$ 200.00	
Water Closet appropriation— amount from State Treasury.....		150.00
amount expended	150.00	
Eave Trough appropriation... amount from State Treasury.....		200.00
amount expended	200.00	
Furniture appropriation— amount from State Treasury.....		1,012.00
amount expended	1,012.00	
Flooring appropriation— amount from State Treasury.....		500.00
amount expended	500.00	
Rostrum Carpet appropriation amount from State Treasury.....		100.00
amount expended	100.00	
Farm-house Plastering appropriation— amount from State Treasury.....		60.00
amount expended	60.00	
Farm-house Carpeting appropriation— amount from State Treasury.....		150.00
amount expended	150.00	
Farm-house Dishes appropriation— amount from State Treasury.....		40.00
amount expended	40.00	
Farm-house Table and Chairs appropriation— amount from State Treasury.....		25.00
amount expended	25.00	
	2,437.00	2,437.00

Respectfully submitted,

J. L. GEDDES, *Deputy Treasurer.*

STATEMENT OF COLLEGE ACCOUNTS FOR THE FISCAL YEAR ENDING
NOVEMBER 10, 1875.

ITEMS.	DR.	CR.	DR.	CR.
Current Expenses of the College.....	\$.....	\$.....	\$ 26,222.03	\$.....
Salaries.....	20,337.65	.....	.....	.....
Contingent expenses.....	2,344.00	.....	.....	.....
Museum.....	243.36	.....	.....	.....
Ornamental grounds.....	599.65	.....	.....	.....
Library.....	636.02	.....	.....	.....
Fires and lights.....	1,993.57	.....	.....	.....
Military department.....	67.78	.....	.....	.....
Department of Agriculture.....	.....	.....	762.78	.....
Farm inventory.....	1,624.82	.....	.....	.....
Farm potato field.....	14.77	.....	.....	.....
Farm pea field.....	8.51	.....	.....	.....
Farm tools.....	92.93	.....	.....	.....
Farm improvements.....	788.99	.....	.....	.....
Farm experiments.....	48.18	.....	.....	.....
Farm household.....	472.72	.....	.....	.....
Farm rye field of 1875.....	.....	93.00	.....	.....
Farm root field of 1875.....	.....	28	.....	.....
Farm corn field of 1875.....	.....	654.90	.....	.....
Farm oat field of 1875.....	.....	219.48	.....	.....
Farm hay field of 1875.....	.....	277.47	.....	.....
Farm teams.....	.....	729.66	.....	.....
Farm products.....	.....	123.14	.....	.....
Farm stock.....	.....	190.21	.....	.....
Excess of expenditures over receipts.....	762.78	3,050.92	2,288.14	.....
Department of Horticulture and Forestry—	.....	.....	1,364.99	.....
Horticulture and Forestry.....	623.90	.....	.....	.....
Nursery.....	220.82	.....	.....	.....
Vineyard.....	3.50	.....	.....	.....
Arboretum.....	30.23	.....	.....	.....
Small Fruits.....	104.39	.....	.....	.....
Horticultural Inventory.....	1,255.58	.....	.....	.....
Orchard.....	.....	348.80	.....	.....
Hedge.....	.....	21.84	.....	.....
Vegetable Garden.....	.....	182.71	.....	.....
Forestry.....	.....	320.00	.....	.....
Total.....	.....	2,238.42	873.43	.....
Excess of expenditures over receipts.....	\$1,364.99	.....	.....	.....
Department of Mechanics—	.....	.....	67.70	.....
Workshop.....	67.70	.....	.....	.....
Department of Physics—	.....	.....	426.32	.....
Physical Laboratory.....	134.76	.....	.....	.....
Philosophical Apparatus.....	201.56	.....	.....	.....
Total.....	.....	426.32	.....	.....
Department of Chemistry—	.....	.....	316.66	.....
Chemical Laboratory.....	433.72	.....	.....	.....
Medicine.....	.....	117.06	.....	.....
Department of Botany and Entomology—	.....	.....	10.81	.....
Botany and Entomology.....	10.81	.....	.....	.....
Inventory of 1875—	.....	.....	.....	.....
Increase of Inventory of Work- shop.....	641.67	.....	.....	.....
Increase of Inventory of Chemi- cal Laboratory.....	338.54	.....	.....	.....
Decrease of Inventory from the Board Department.....	759.07	.....	.....	.....
Decrease of Inventory from School Books.....	697.01	.....	.....	.....
Decrease of Inventory from fires and lights.....	136.00	.....	.....	.....
.....	\$974.21	1,592.08	.....	.....
To balance decrease of Inventory transferred to interest fund.....	.....	.....	.....	617.87
.....	.....	.....	29,171.29	617.87

STATEMENT OF COLLEGE ACCOUNTS.—CONTINUED.

ITEMS.	DR.	CR.	DR.	CR
Interest Fund—				
By balance from last year.....	\$.....	\$ 3,682.53	\$.....	\$.....
To amount expended as above.....	29,171.29			
To amount paid Mathews and Foote.....	989.95			
To amount paid Apiary expenses.....	63.00			
By amount transferred from fixtures account.....		500.00		
By amount through decrease of inventory.....		617.87		
By amount from G. W. Bassett, agent.....		33,588.75		
	30,224.24			
To amount unexpended to balance.....	8,164.91			8,164.91
	8,164.91	38,389.15		
Contingent Fund—				
Balance from last year.....		2,543.17		
Amount received from T. J. Stone, agent.....		705.27		
Amount received on McLaren & Duff's note.....		50.72		
Paid G. W. Jones' note.....	90.00			
To balance amount unexpended.....	3,209.16			3,209.16
	3,209.16	3,209.16		
Freight Drawbacks—				
Balance from last year		33.35		
Amount received from C. & N. W. R. R.....		455.16		
Amount expended	449.60			
To balance amount unexpended.....	38.91			38.91
	38.91			
Diplomas—				
Balance from last year.....		79.10		
Amount unexpended.....	32.85			
Amount received from graduates.....		85.00		
To balance amount unexpended.....	131.25			
	131.25	164.10		131.25
Interest on Notes—				
Balance from last year.....		67.60		
Amount received.....		115.16		
To balance amount unexpended.....	182.76			182.76
	182.76	182.76		
School Books—				
Balance from last year.....		48.94		
Amount received from school book dep't.....		262.88		
Amount of inventory.....	701.37	311.82		
To balance excess of receipts.....		389.55	389.55	
Laundry—				
Balance from last year.....		8.61		
Amount received for washing.....		1,563.73		
Amount expended.....	1,572.34	1,572.34		
Incidental Expenses—				
Balance from last year		70.77		
Amount received from students, <i>et al</i>		1,532.54		
Amount closed into repairs' account.....	293.37			
Amount expended on repairs and cleaning.....	1,419.92			
	1,653.29	1,653.29		
Bills Receivable—				
Balance from last year.....	2,756.62			
Notes received.....	870.72			
	3,627.34			
Notes paid.....		1,249.59		
To balance notes on hand.....		2,377.75		
		2,377.75		

STATEMENT OF COLLEGE ACCOUNTS.—CONTINUED.

ITEMS.	DR.	CR.	DR.	CR.
Boarding Department—				
Dr. balance from last year.....	\$ 1,778.19	\$.....	\$.....	\$.....
Amount expended.....	14,884.01	.....	.....	.....
	16,662.20	.....	.....	.....
Amount received from students, <i>et al</i>.....	.....	17,522.53	.....	.....
To balance amount unexpended.....	860.33	.....	.....	860.33
Personal Accounts—				
Amount due from sundry persons.....	420.95	.....	420.95	.....
Balance from last year.....	924.13	.....	.....	.....
Amount received from all sources, except sales of lands.....	72,909.78	.....	.....	.....
	73,833.91	.....	.....	.....
Amount paid out as per vouchers.....	.....	65,766.73	.....	.....
To balance cash on hand.....	.....	8,067.18	8,067.18	.....
Endowment Interest Fund—				
Received interest on bonds State Treasurer.....	.....	1,477.00	.....	1,477.00
Permanent Endowment Fund—				
Amount in State Treasury from College Land sales.....	.....	41,330.92	.....	41,330.92
Donations—				
Amount received from sale of land donated to the College.....	.....	400.00	.....	400.00
State Treasurer—				
Amount in hands of State Treasurer from College Land sales.....	41,330.92	.....	41,330.92	.....
Corn Field of 1876.....	62.65	.....	62.65	.....
Gas supply.....	.....	.....	.....	.....
Dr. balance.....	2,474.25	.....	4,474.25	.....
Appropriations—				
Seed appropriation.....	.....	.....	.....	.....
Balance from year.....	.....	168.85	.....	.....
Amount expended.....	26.18	.....	.....	.....
To balance amount unexpended.....	142.67	.....	.....	142.67
Appropriations of 1868—				
Balance from last year.....	.....	118.80	.....	.....
Amount expended for south road.....	59.06	.....	.....	.....
To amount unexpended.....	59.74	.....	.....	59.74
Water Supply—				
Balance from last year.....	.....	50.07	.....	.....
Amount expended.....	76.85	.....	.....	.....
To balance amount in excess of receipts.....	.....	26.78	26.78	.....
Farm Improvement Appropriation—				
Dr. balance from last year.....	1,963.86	.....	1,963.86	.....
Main Laboratory Building—				
Cr. balance.....	.....	748.41	.....	748.41
College Extension—				
Cr. balance.....	.....	63.52	.....	63.52
Furnace Appropriation—				
Balance from last year.....	.....	168.14	.....	.....
Amount expended.....	16.50	.....	.....	.....
To balance amount unexpended.....	151.64	.....	.....	151.64
Furnace Piping Appropriation—				
Cr. balance.....	.....	150.00	.....	150.00
Hall Matting Appropriation—				
Cr. balance.....	.....	1.22	.....	1.22

AGRICULTURAL COLLEGE ACCOUNTS.—CONTINUED.

ITEMS.	DR.	CR.	DR.	CR.
Farm house Painting Appropriation—				
Cr. balance.....	\$.....	\$ 1.45	\$.....	\$ 1.45
Physical Laboratory Building Appropriation—				
Balance from last year.....		139.50		
Amount received from State Treasurer.....		13,597.64		
Amount expended as per vouchers in Auditor's office.....	13,737.14			
		13,737.14	57,113.89	57,113.89

SUMMARY.

1875.	DR.	1875.	CR.
Nov. 10	To bills receivable.....\$ 2,377.75	Nov. 10	By freight drawbacks.....\$ 38.91
"	To corn field of 1876 62 65	"	By furnace appropriation.. 151.64
"	To farm improvement ap- propriation 1,963.86	"	By furnace piping..... 150.00
"	To gas supply..... 2,474.25	"	By hall matting..... 1.22
"	To school-books..... 389.55	"	By farm-house painting.... 1.45
"	To water supply..... 26.78	"	By endowment interest fund..... 1,477.00
"	To State Treasurer..... 41,330.92	"	By interest fund..... 8,164.91
"	To personal accounts..... 420.95	"	By interest on notes..... 182.76
"	To cash on hand 8,067.18	"	By contingent fund..... 3,209.16
		"	By main laboratory build- ing 748.41
		"	By College extension..... 63.52
		"	By appropriations of 1868... 59.74
		"	By diplomas 131.25
		"	By permanent endowment fund..... 41,330.92
		"	By donations 400.00
		"	By seed appropriations..... 142.67
		"	By board department..... 860.33
	\$57,113.89		\$57,113.89

Respectfully submitted,

J. L. GEDDES, *Deputy Treas.* S. A. C.

REPORT OF SECRETARY OF THE BOARD OF TRUSTEES.

IOWA STATE AGRICULTURAL COLLEGE, }
NOVEMBER 11, 1875. }

To the Honorable Board of Trustees:

GENTLEMEN:—In accordance with the law specifying the duties of the Secretary, I beg leave to submit the following report for the College year commencing November 12, 1874, and ending November 10, 1875.

During the year, I have, as directed by section 1612 of the Code, opened and kept an account with William D. Lucas, Treasurer of the College. I have debited him with cash on hand at the begining of the year, and with all moneys received by him, during the year, from whatever source. I have credited him with the amounts paid out by him on the order of the Board of Audit. Your attention is called to my book of "Monthly Statements of Treasurer's Accounts," in which you will find an itemized statement of all the amounts with which the Treasurer has been debited; also, of the various sums with which he has been credited. As shown by my books, the cash balance in the hands of the Treasurer at the beginning of the year, was \$924.13. During the year I have debited him with cash received from all sources, except from the sale of lands, \$72,907.38. I have credited him with cash paid out, as per vouchers, \$65,764.33, leaving as the balance now in the hands of the Treasurer \$8,067.18. This balance I have not counted, but the Treasurer informs me that he is prepared to produce it before the Board. In addition to the above, I have debited the College Treasurer with cash received from G. W. Bassett, in payment for lands sold, amounting to \$31,743.29. I have credited him with the same amount upon receipts from the State Treasurer, showing that the money had been duly forwarded. The above amount, added to \$12,562.13 received from the same source, in previous years, makes a total of \$44,305.42 received from the sale of land, and forwarded to the State Treasurer. Of this amount, \$12,200.00 has been invested in

bonds, leaving as the cash balance now in the hands of the State Treasurer, \$32,105.42.

In connection with the President of the College, I have examined all bills presented for payment, allowing such as were deemed properly payable from the funds of the College, and for which appropriations had been made by the Board of Trustees. In no case, with perhaps one exception, have the expenditures exceeded the appropriations. In the department of Horticulture and Forestry, the appropriation was \$1000, while the Treasurer's books show a debit balance against said department of \$1,364.99, an excess above the appropriation of \$364.99. Prof. McAfee, in charge of the department, claims that there must be some error, either in the charges or credits, or the account would not show thus.

I have made a monthly examination of the books and vouchers of the Treasurer. In so doing I have pursued the following plan:

First.—I have examined each voucher. I find that all the vouchers have been properly endorsed by the Auditing Committee, and that with a few exceptions, receipts have been filed with each voucher. In a few cases parties who have been paid with drafts have neglected to return receipts. In all such cases I have examined the bank statements of the banks upon which the drafts were drawn, and find that all such drafts have been paid. *Second.*—I have carefully examined each original entry in the Day-book and compared it with its voucher. *Third.*—I have taken note that the different accounts were closed into their proper funds. *Fourth.*—By comparing balances, and by various other means, I have tested the accuracy of the work upon the books. The clerical errors discovered, wherever they affected the different funds, have been corrected.

I have endeavored to make the examinations thorough and complete, and as the results of said examination, I hereby certify to the correctness of the accounts as kept by the Treasurer during the fiscal year ending Nov. 10, 1875.

Respectfully submitted,

E. W. STANTON, *Secretary.*

ABSTRACT OF THE
PROCEEDINGS OF BOARD OF TRUSTEES.
FOR THE YEARS 1874 AND 1875.

MAY MEETING.

May 1, 1874.

Present, Messrs. Kirkwood, Summers, Tracy, Warden and Whiting.
Board organized by electing Hon. S. J. Kirkwood, permanent chairman, and M. Stalker Secretary.

Ordered, That the title of Professor Bessey, be changed from "Professor of Botany and Horticulture" to "Professor of Botany, Zoology and Entomology."

May 2, 1874.

All members present.

Ordered, That the Register of the State Land Office be requested to send all patents, hereafter issued for College lands, to G. W. Bassett, Ft. Dodge, Iowa; and that the Secretary of the Board notify the Register of the State Land Office of the above action of the Board.

May 4, 1874.

All members present.

Ordered, That Cicero Close and O. H. P. Buchanan, survivors of the Trustees appointed by certain trust deeds, made by Samuel E. Rankin, creating trust in favor of the Iowa State Agricultural College, be and they are hereby directed to execute said trust, to the extent of the interest of said College therein, by the conveyance, transfer and payment to the State of Iowa of all land, property and moneys, received in trust from said Rankin and still remaining in their hands. [The above order in compliance with the requirements of Section 4, Chapter 78, acts of Fifteenth General Assembly of the State of Iowa.]

Ordered, That the following appropriations heretofore made, viz :

For Chemical Laboratory.....	\$1,500.00
For Workshop	1,500.00
For Library.....	800.00

Be so reduced that the amounts appropriated shall be as follows :

For Chemical Laboratory.....	\$1,000.00
For Workshop.....	1,000.00
For Library.....	500.00

Ordered, That there be appropriated from the Interest Fund, the sum of \$300.00 as compensation to the Treasurer of the College for his services during the fiscal year commencing November 13, 1873, and ending November 11, 1874; and that \$200.00 be appropriated from the same fund to the Deputy Treasurer for his services during the same period.

Ordered, That there be appropriated from any fund which can be legally applied to the purposes specified, the following sums :

For Department of Botany and Entomology.....	\$200.00
For Museum.....	100.00
For Painting the new barn and the wood-shed to the President's house.....	150.00
For paying the expenses of President Thatcher, incurred while lecturing at the College.....	25.00
For the purchase of matting for the hall of the second floor of the College building.....	60.00

Ordered, That there be appropriated from the Contingent Fund, the sum of \$200.00, or so much thereof as may be necessary, for the purchase of a spring wagon for the use of the Steward.

Ordered, That the sum of \$80.00 be appropriated for the payment of the expenses of President Welch, incurred at Des Moines, while attending the College Investigation.

Ordered, That the chairman of the board obtain the opinion of the Attorney General in regard to the claims of Messrs. Jones, Foote, and Mathews for salary from Nov. 13, 1873, to March 1, 1874.

Ordered, That an additional sum of \$300.00 be appropriated for the use of the Department of Horticulture; also that the Professor in charge be allowed to expend all moneys received from sales in his department in the further improvement of the department.

MAY 5.

All members present.

Ordered, That there be appropriated, from any fund which can be legally applied to the purpose specified, the following sums, or so much thereof as may be necessary :

For repairing the house occupied by Professors Hutchins and Thompson.....	\$200.00
For purchasing churn and washing machine for farm.....	75.00

Ordered, That President Welch be authorized to enter into a contract with J. J. McDougall for the furnishing of brick of his manufacture for the New Physical Laboratory, upon the following conditions, viz. : The brick shall be good merchantable brick ; one-third front brick ; one-third arch brick ; one-third salmon brick, all of good quality. Said brick shall be delivered on the ground, at the College, in three piles, each quality by itself, stacked in good order. The price paid for said brick shall be \$9 per thousand, actual count, all unsuitable brick to be rejected and deducted.

Ordered, That President Welch be authorized to enter into a contract with H. N. Tupper, for the furnishing of stone for the foundation of the New Physical Laboratory, upon the following conditions, viz. : The stone furnished shall be of the best quality procurable at said Tupper's quarry. It shall be delivered for \$2.50 per perch of twenty-five feet, measured in the wall, actual, not mason's measure. All unsuitable stone shall be rejected.

Ordered, That President Welch require, from each of the above parties, a bond for faithful performance of contract.

Ordered, That Trustee Warden be appointed a special committee to proceed to Des Moines, and procure proper drawings, specifications and estimates for the erection and cost of the laboratory, of a size not greater than 70x44 feet.

Ordered, That there be appropriated, from any fund which can be legally used for the purposes specified, the following sums:

For repairing oven in boarding department.....	\$100.00
For carpeting front hall and repairing organ.....	50.00

MAY 6.

All members present.

Ordered, That \$250 be appropriated from any fund which can be used for that purpose, to constitute a "Contingent Repair Fund," to be used for general repairs on College buildings.

The Farm Committee submitted the following report :

To the Board of Trustees: .

Your committee beg leave to report the following suggestions :

1. That the Farm Superintendent, under the advice of the President, be authorized to dispose of such common and grade stock, including cattle, sheep and hogs, as are not needed for the purposes of the farm.

2. That the Farm Superintendent be instructed to keep, on an average, twenty cows for the purpose of furnishing milk for the College boarding department; that as soon as possible, without loss to the farm, the stock be reduced to thoroughbreds or such high grade, and milking cows as may be needed on the farm, and that the sum of \$250 be appropriated for such repairs upon farm buildings, as are necessary and are not otherwise provided for.

Report accepted.

Ordered, That products of the farm, furnished to the boarding department, be estimated at their market value, and that the price of the products of the garden and of the small fruits, be fixed by the Steward, the head of the department by which they are furnished, and the President of the College.

Ordered, That Trustee Warden and President Welch constitute a committee to act upon the plans and specifications furnished by the architect, for the new Physical Laboratory; and to advertise for bids on contract for the erection of the same.

Ordered, That M. Stalker be elected Secretary, to serve until the close of the current College year; that as such Secretary, he shall have the supervision of the duties of the office; that Sallie Stalker be elected Assistant Secretary, and discharge the general duties of the office, under the supervision of the Secretary, and that the sum of \$100.00 be appropriated for the salary of the Assistant Secretary from this time to the close of the current College year.

Ordered, that an appropriation of \$100.00 be made to M. Stalker, in payment for his services as Secretary up to the close of the College year.

Ordered, That the Treasurer of State be requested to purchase Iowa State Bonds to the amount of the Endowment Fund now in his hands and that he be authorized to draw on the Treasurer of the Iowa State Agricultural College for the premium required to enable him to make such investment, and that the College Treasurer be directed to honor

his draft and pay the same out of any fund that can be legally applied for such purpose.

Messrs. Summers, Tracy and Whiting, appointed committee on mileage and per diem submitted the following report :

To the Board of Trustees :

Your committee on mileage and per diem, beg leave to submit the following:

NAME.	No. of miles.	Mileage.	No. of days.	Per diem.	TOTAL.
S. J. Kirkwood.....	280	\$ 14.00	7	\$ 35.00	\$ 49.00
L. Summers.....	420	21.00	7	35.00	56.00
A. Tracy.....	440	22.00	8	40.00	62 00
C. C. Warden.....	320	16.00	7	35.00	51.00
C. E. Whiting.....	320	16.00	7	35.90	51.00

Respectfully submitted,

LAUREL SUMMERS, *Chairman.*

Report adopted.

Adjourned to meet at the call of the Secretary.

M. STALKER, *Secretary.*

JULY MEETING.

JULY 2, 1874.

Present: Messrs. Kirkwood, Summers, Tracy, Warden, and Whiting. Minutes of the May meeting read and approved.

Ordered, That the contracts entered into by A. S. Welch, as agent for the Iowa State Agricultural College, with J. J. McDougal for the furnishing of brick, and with H. N. Tupper for furnishing stone, for the new Physical Laboratory, be and the same are hereby approved.

Ordered, That the Board proceed to open and examine bids for building the Physical Laboratory.

The bids were as follows:

James Ewing, Des Moines.....	\$13,500
Fawcett Brothers, Chariton	15,995
J. B. Locke, Vinton.....	15,980
Hugh Brown, Iowa City.....	13,500
Pickett & Carnes, and S. M. Hendricks, Chariton.....	15,400
D. H. Alvord, Ames.....	17,000

Ordered, That the contract for building the new Physical Laboratory be awarded to Hugh Brown upon his bid this day examined, upon the following conditions:

1. That within ten days, he enter into contract with the chairman of the Board, as agent for the College, for the faithful performance, in accordance with the specifications, of the work bid for.

2. That, within ten days, he execute a bond, in the sum of \$7,000.00, to be approved by S. J. Kirkwood, for the faithful performance of this contract.

3. That the contract to be made by him shall require the building to be enclosed by the 11th of November, 1874, and the inside work to be completed by the 1st of July, 1875.

4. That the contract shall provide for payments to the contractor on monthly estimates, fifteen per cent. of each estimate to be retained until the completion of the building.

5. That the contractor shall take the brick and stone bargained for with McDougall and Tupper, at the prices agreed to be paid them.

Ordered, That Trustee Whiting be appointed a committee to procure from T. J. Stone, Land Agent at Sioux City, a statement of the moneys in his hands belonging to the College, and the prompt remittance of the amount due, to the Treasurer of the College.

Ordered, That Trustee Summers be appointed Superintendent of the work on the New Laboratory, and that his compensation be fixed at five dollars per day.

Ordered, That, upon receipt, by the Treasurer of the College, of moneys belonging to Physical Laboratory Building Fund, for which monthly requisitions shall be made, he shall pay out the same, only upon bills audited by the President of the College, and the Secretary of the Board; taking therefor, in addition to the vouchers as now taken, an additional voucher to be forwarded to the Auditor of State.

Trustee Summers was appointed a Committee on Mileage and per diem. He reported the following report, which was adopted:

To the Board of Trustees:

Your Committee to whom was referred the subject of Mileage and per diem, beg leave to submit the following report:

NAME.	No. of miles.	Mileage.	No. of days.	Per diem.	TOTAL.
S. J. Kirkwood.....	280	\$ 14.00	4	\$ 20.00	\$ 34.00
L. Summers.....	420	21.00	4	20.00	41.00
A. Tracy.....	440	22.00	7	35.00	57.00
C. C. Warden.....	780	39.00	9	45.00	84.00
C. E. Whiting.....	372	18.60	5	25.00	43.60

Respectfully submitted,

M. STALKER, *Secretary.*

Adjourned *sine die.*

NOVEMBER MEETING.

NOVEMBER 10, 1874.

Present, Messrs. Summers, Tracy, Warden, and Whiting.

A committee was received from the Faculty recommending for graduation, the following students:

Charles E. Clingan,
 Monroe C. Litteer,
 Orlando P. McCray,
 Edward A. Pyne,
 William R. Smith,
 Kate N. Tupper,
 Estelle J. Bebout,
 Eugene R. Clingan,
 George W. Kiesel,
 Eva E. Paul,

Ida E. Smith,
 Samuel Y. Yates,
 G. Earl Marsh,
 Charles S. Chase,
 Mary A. Palmer,
 Alfred A. Parsons,
 Charles P. Hastings,
 Charles D. Boardman,
 Joseph R. Whitaker.

Ordered, That the resolution of the Faculty, recommending the above persons for graduation be approved.

NOVEMBER 12.

All members present.

Minutes of July meeting read and approved.

Reports of departments read and referred to appropriate committees.

NOVEMBER 13.

All members present.

Ordered, That the claim of Professor G. W. Jones, for \$720, the balance due him on salary, be allowed and paid from Interest Fund, subject to a deduction of \$90.

Ordered, That Prof. James Mathews be allowed the sum of \$478.98 on salary claimed by him, and that the same be paid from Interest Fund.

Ordered, That the following sums of money, or so much thereof as may be actually necessary, be appropriated from the Interest Fund for the purposes specified; said sums to be expended upon the order of the President of the College, he having discretion to lessen the amounts on any of them, in case there shall be a deficiency of funds :

Farm.....	\$1,000
Horticulture.....	1,000
Chemical Laboratory.....	1,000
Workshop... ..	1,000
Library	1,000
Department of Physics.....	600
Museum.....	400

The salaries were fixed as follows :

President.....	3,500
Professor of Military Tactics, Steward and Deputy Treasurer..	1,800
Professor of Botany, Zoology and Entomology.....	1,600
Professor of English Literature.....	1,600
Professor of Mechanical Engineering	1,600
Professor of Horticulture and Forestry.....	1,400
Professor of Civil Engineering	1,600
Professor of Chemistry	1,600
Assistant Professor of Mathematics	1,200
Assistant Professor of Physics	1,200
Superintendent of Farm and Instructor in Practical Agriculture, (with board).....	1,200

Instructor in Chemistry.....	\$ 700
Matron of College.....	1,000
Preceptress.....	1,000
Matron of Farm House (with board).....	500
Treasurer	300
Instructor in German.....	100

Ordered, That the following sums, or so much thereof as may be needed, be appropriated from Interest Fund for the purposes specified:

For contingent expenses.....	\$2,000
For fires and lights.....	2,500
For Military Department	50
For purchasing models in free hand drawing.....	100
For printing and distributing annual.....	250

Ordered, That the following sums, recommended by the Professor of Mechanical Engineering, be appropriated from Contingent Fund for the purposes specified :

Repairing boiler and painting.....	\$ 40
Stillwell heater.....	125
Freight on same and making connections	20
Two retorts.....	150
Fire brick and building arches.....	40
Lime, sand, and freight.....	20
Plastering cistern	30
600 feet 4-inch pipe.....	300
Lead, and laying pipe.....	100

Ordered, That the charges against students for fires and lights be changed from \$1.50 per month to \$2 per month.

Ordered, That W. D. Lucas be elected Treasurer of the College ; Miss Nancy Wills, Librarian ; and Miss Nettie Fish, Assistant Librarian.

Ordered, That E. W. Stanton be elected Secretary of the Board of Trustees ; that his salary be fixed at \$50 per annum, and that he enter upon the duties of his office Nov. 16, 1874.

NOVEMBER 14.

All members present.

The committee to whom was referred the subject of a one-year course in Agriculture, reported in favor of such a course.

Report adopted.

Ordered, That all increase in salaries begin with the opening of the spring term in March, 1875.

Ordered, That Mr. Hugh Brown be directed to build a portico and steps to the new Physical Laboratory, according to the plans and specifications furnished by Mr. Finkbine, and that the sum of \$1,100 be allowed him for said work.

Mr. Summers, committee on mileage and per diem, submitted the following report:

To the Board of Trustees:

The committee on mileage and per diem beg leave to report the following:

NAMES.	No. of miles.	Mileage.	No. of days.	Per diem.	TOTAL.
S. J. Kirkwood.....	320	\$ 16.00	7	\$35.00	\$ 51.00
L. Summers.....	420	21.00	5	25.00	46.00
A. Tracy	440	22.00	13	65.00	87.00
C. C. Warden.....	260	13.00	9	45.00	58.00
C. E. Whiting.....	372	18.60	9	45.00	63.60

Respectfully submitted,

L. SUMMERS.

Report adopted.

Adjourned.

M. STALKER, *Secretary*.

JANUARY MEETING.

JANUARY 12, 1875.

Present: Messrs. Kirkwood, Summers, Tracy, and Whiting.
Minutes of the November meeting read and approved.

JANUARY 13.

All present except Mr. Warden.
Report of the Treasurer for the fiscal year ending November 11, 1874, read and referred to executive committee.

Ordered, That there be allowed to Mr. Hugh Brown for extra work on Physical Laboratory, the following sums:

For extra work on cornice.....	\$362.00
For work on gable windows.....	8.50
For 127 feet of eave trough.....	30.48
For 45 feet conductors.....	10.80
For 6 elbows.....	2.00
Total.....	<u>\$413.78</u>

JANUARY 14.

All present except Mr. Warden.

Ordered, That the Treasurer be authorized to make such legitimate entries in his books as are necessary to make the balance of bills receivable account correspond with the amount of notes on hand.

Ordered, That the Superintendent of the Farm, under the direction of the President of the College, shall conduct, during the current year, such experiments as the funds at his disposal will admit, as may tend to show the relative value in feeding of dry whole corn, steamed whole corn, dry corn meal, and corn meal soaked; also such experiments as will show the value of manures in the production of corn and wheat.

Ordered, That the sum of \$59.06 be appropriated from the fund known on the College books as the "Appropriation of 1868," for the purpose of improving the road running along the south side of the College Farm.

Ordered, That the salary of the Treasurer be increased to \$400.00 per annum, and that said increase commence January 1, 1875.

Ordered, That in addition to the appropriations made at the meeting of the Board in November, 1874, for the departments of Agriculture, Horticulture and Mechanics, there is hereby appropriated the proceeds of the sales made by said departments respectively; but the entire appropriation thus made to each of said departments is subject to deductions for the amount of all legitimate charges against such departments by any other department. Appropriations made to all departments are subject to similar deductions. In addition to the appropriations made at the meeting of November, 1874, for fires and light, there is hereby appropriated the money received from students for fires and lights.

JANUARY 15.

All members present, except Mr. Warden.

Ordered, That the price of board for the ensuing year be increased to \$2.65 per week.

Ordered, That the resignation of Miss Mary Lovelace, as Preceptress, be accepted, and that her salary be paid up to the date of the acceptance of her resignation.

Ordered, That the claim of A. E. Foote for \$509.97 for salary due him, be allowed.

The Farm Committee submitted the following report, which was adopted:

To the Board of Trustees:

Your Committee on Farm Superintendent's report, beg leave to recommend that Trustee Kirkwood be authorized to procure a pump for the use of the farm house well; that the Farm Superintendent procure a sufficiency of spouting to protect the barn from damage; that the floor of the horse barn be removed, and that the Farm Superintendent be authorized to build the new fence and repair the old one, as per his own suggestion.

Your committee are not prepared, at this time, to make any recommendations in regard to a house for swine, or purchasing additional stock, for want of means; but they most earnestly recommend that every dollar made on the farm be expended in necessary improvements upon the farm and for the purchasing of stock for the same.

C. E. WHITING, }
A. TRACY. } *Committee.*

The same committee also submitted the following report, which was adopted:

To the Board of Trustees:

Your committee recommend that Professor McAfee be instructed to fill the low ground with timber, as he and the President of the College may think best; that the pipe for garden be laid, providing it can be done with the appropriation already made; and that the Professor of Horticulture be authorized to try as many of experiments recommended by him, as he and the President may deem necessary.

C. E. WHITING, }
A. TRACY. } *Committee.*

The Executive Committee submitted the following report:

To the Board of Trustees:.

The Executive Committee, to whom was referred the report of the College Treasurer, beg leave to report that they have examined the same, in connection with the report in writing, made by the Secretary of the Board, showing the result of his examination of the books of the Treasurer and his vouchers, your committee find: *First*, That the Treasurer has properly charged himself with all moneys received by him from all sources during the past years; *Second*, That he has exhibited proper vouchers for all sums claimed to have been paid by him and credited to him on his cash account; *Third*, That the balance in the Treasurer's hands at the commencement of the year was \$134.60; that he received, from all sources, during the year, \$68,048.20; that he paid, during the year, as per his vouchers, in cash, \$67,258.67; and that there was, at the close of the year, in his hands a balance of \$924.13.

All of which is respectfully submitted.

S. J. KIRKWOOD, }
L. SUMMERS, } *Committee.*

Ordered, That an appropriation of \$500.00 be made from Contingent Fund, for contingencies not payable from the Interest Fund proper.

Ordered, That the balance of "New Laboratory Building Fund," be appropriated for the completion of that building; the same to be expended under the direction of Trustee Summers, as Superintendent; and that all bills for the same be audited by the President of the College and the Secretary of the Board of Trustees.

Ordered, That the President of the College be authorized to employ some person to act in the place left vacant by the resignation of Miss Lovelace.

Mr. Summers, Committee on Mileage and *per diem.*, submitted the following report:

To the Board of Trustees:.

Your committee beg leave to report that the following members of the Board of Trustees are entitled to mileage and *per diem.* for the amounts set opposite their names.

NAME.	No. of miles.	Mileage.	No. of days.	Per diem.	Total.
S. J. Kirkwood.....	320	\$ 16.00	6	\$ 30.00	\$ 46.00
L. Summers.....	420	21.00	7	35.00	56.00
A. Tracy.....	440	22.00	7	35.00	57.00
C. E. Whiting.....	372	18.60	6	30.00	48.60

Respectfully submitted,

L. SUMMERS.

Report adopted.

Adjourned.

E. W. STANTON, *Secretary*.

JUNE MEETING.

JUNE 8, 1875.

Present, Messrs. Kirkwood, Summers, Tracy, Warden and Whiting.
Minutes of January meeting read and approved.

Ordered, That all bills for moneys payable to any member of the Faculty of the College, or in which any of the Faculty are personally interested, other than the regular salary due to each, shall be submitted to the Board of Trustees for approval, before the same shall be paid.

Ordered, That the Auditing Committee be authorized to pay the expenses of keeping the ornamental grounds in order, out of Contingent Expense appropriation.

Ordered, That the President and Faculty be authorized to close the term for the present year at a date earlier than the regular close of the term, if in their judgment it shall be necessary so to do, to guard the health and safety of the students, by reason of the insufficient heating apparatus in the College building.

JUNE 9.

All present except Mr. Tracy.

Ordered, That the contract entered into by President Welch with Mrs. A. Thompson as housekeeper for the College be approved.

Ordered, That the action of President Welch, in employing Mrs.

Welch as teacher in the College, be approved, and that her salary be fixed at \$400.00 per annum, said salary to commence with the beginning of her services.

Ordered, That, when the Trustees or Faculty order any part of the ornamental grounds placed temporarily under cultivation by either the farm or the horticultural department, the proceeds of the crops shall pass into the hands or to the credit of the department so cultivating.

Ordered, That all cultivated or artificial timber $\frac{3}{8}$ under the care of the horticultural department; also, such native timber grounds as the Board may designate as ornamental grounds; the remaining timber shall be held as belonging to the farm, and shall be under the care of the Farm Superintendent.

Ordered, That there be allowed to Mr. Hugh Brown the sum of \$785.60, in full of all claims for extra work done and material furnished on account of the new Physical Laboratory building; provided, that such work as may be now incomplete be made complete and to the satisfaction of the superintendent, Trustee Summers, who is hereby authorized to settle in full with said Brown, and, on behalf of the Board, to formally accept from him the building.

Ordered, That the chairman of the Board be authorized to employ R. S. Finkbine to make a survey of the College building, and more particularly the north wing thereof; and to report in writing what alterations or repairs he may deem necessary for the safety and proper preservation of the wing; and also to report upon the safety and sufficiency of the heating apparatus, and what changes, if any, are necessary therein, and the approximate cost of all the work he may recommend.

Ordered, That the timber in the northwest corner of the farm, lying south of the railroad, be held as ornamental grounds, and the same is hereby placed in charge of the Horticultural Department.

Ordered, That the Treasurer of State pay to the Treasurer of the College all interest on bonds belonging to College Endowment Fund, at such times as the interest on said bonds may become due.

Mr. Summers, Committee on mileage and per diem, submitted the following report, which was adopted :

To the Board of Trustees:

Your Committee beg leave to report that the members of the Board are entitled to mileage and per diem for the amounts set opposite their names—

NAMES.	No. of miles.	Mileage.	No. of days.	Per diem.	Total.
S. J. Kirkwood	320	\$ 16.00	5	\$ 25.00	\$ 41.00
L. Summers.....	420	21.00	4	20.00	41.00
A Tracy.....	440	22.00	6	30.00	52.00
C. C. Warden.....	260	13.00	5	25.00	38.00
C. E. Whiting.....	372	18.60	5	25.00	43.60

Respectfully submitted,

L. SUMMERS.

Adjourned *sine die*.

E. W. STANTON, *Secretary*.

OCTOBER MEETING.

OCTOBER 25, 1875.

Present, Messrs. Summers, Tracy, Warden and Whiting.

Mr. Summers chosen chairman *pro tem*.

OCTOBER 26.

All members present except Mr. Kirkwood.

Ordered, That the Secretary be instructed to notify the agents for the sale and lease of College lands, that the Board require a surrender of their contracts on the first of January, 1876, in compliance with the statutes requiring the Secretary of the Board to lease said lands.

OCTOBER 27.

All members present.

The following communication was received from the Faculty :

To the Board of Trustees of the Iowa State Agricultural College :

GENTLEMEN :—The Faculty of the College have adopted the following resolution :

Resolved, By the Faculty of the Iowa State Agricultural College, that the following students be recommended to the Board of Trustees for graduation :

In the Course in Agriculture :

Millah M. Cherrie.

Rinaldo P. Kelley.

Frank J. Macomber.

Thomas L. Palmer.

Charles E. Peterson.

Lucius C. Thornton.

In the course in Civil Engineering :

E. P. Cadwell.

William L. Lamoreux.

Herbert R. Patrick.

James M. Whitaker.

In the course in Mechanical Engineering :

Charles H. Lee.

In the course in General Science:

Martin E. Rudolph.

In the course in General Science for ladies :

Alice Cunningham.

Lizzie Curtis.

Hannah P. Lyman.

Celestia N. Neal.

Ida Ross.

Ida L. Sherman.

Nancy Wills.

Lizzie Wilson.

By order of the Faculty.

C. E. BESSEY, *Secretary.*

College, Oct. 25th, 1875.

On motion, the above resolution was approved, and the Faculty ordered to issue diplomas to the persons therein named.

Ordered, That the sum of 54.00 be allowed Mr. Summers for traveling expenses from Le Claire, Scott county, to the College, and returning—three trips—while acting as Superintendent of the new Physical Laboratory; and that the same be paid from Physical Laboratory appropriation.

Mr. Summers, committee on mileage and per diem, submitted the following report :

To the Board of Trustees :

Your committee beg leave to report that the members of the Board are entitled to mileage and per diem for the amounts set opposite their names.

NAMES.	No. of miles.	Mileage.	No. of days.	Per diem.	TOTAL.
S. J. Kirkwood.....	320	\$ 16.00	4	\$ 20.00	\$ 36.00
L. Summers.....	420	21.00	5	25.00	46.00
A. Tracy.....	440	22.00	8	40.00	62.00
C. C. Warden.....	260	13.00	7	35.00	48.00
C. E. Whiting.....	372	18.60	7	35.00	53.60

Respectfully submitted,

L. SUMMERS.

Adjourned *sine die*.

E. W. STANTON, *Secretary.*

NOVEMBER MEETING, 1875.

NOVEMBER 10.

Present, Messrs. Kirkwood and Summers.

Adjourned.

NOVEMBER 11.

All members present, except Mr. Warden.

Minutes of June and October meetings read and approved.

Reports of departments read and referred to appropriate committees.

Ordered, That the sum of \$500.00, or so much thereof as may be necessary, be appropriated from Contingent Fund, for the purpose of repairing boiler in Workshop ; for repairing boiler and pumps at water works, and furnishing protection for the same ; and for repairs upon gas works.

NOVEMBER 12.

All members present except Mr. Warden.

Ordered, That the services of Mrs. E. S. Tupper, as Bee Lecturer at the College, be discontinued.

NOVEMBER 13.

Ordered, That the sum of \$200, or so much thereof as may be necessary, be appropriated from Interest Fund, for purchasing seventeen bedsteads and five tables for College dormitories.

Ordered, That G. W. Bassett be continued in office as agent of the Board of Trustees, from the expiration of his present contract with the Board, until the further order of the Board, for the following purposes :

1. For the purpose of receiving from the lessees of College lands such sums of principal and interest as may become payable to the College, and for transmitting the same to the Treasurer of the College monthly.

2. For the purpose of leasing such of the College lands as are not now under lease, and such as may become forfeited for non-payment of interest.

And that said Bassett, before he performs any act under this authority, shall execute his bond to the State of Iowa, with good and sufficient sureties, to be approved by the President of the College, in the sum of ten thousand dollars, conditioned for the faithful performance of his duties as such agent.

In case of application for renewal of present leases under Section 2, Chapter 71, Acts of 1874, relating to leasing of College lands, said agent shall receive applications for such renewals, and transmit the same and new leases, prepared for signature, to the Secretary, for execution, who shall execute and return the same to said agent. Neither said agent nor said Secretary shall receive extra compensation for such renewal of lease. For the other services hereby required of said agent, he shall be entitled to receive the same compensation to which he is now entitled for similar services.

Ordered, That E. W. Stanton, Secretary of the Board of Trustees, be authorized, at the expiration of the contract with G. W. Bassett, on the first of January, 1876, to examine the books and papers connected with the agency of said Bassett, during the time of his contract to lease lands for the Iowa Agricultural College; also to settle with T. J. Stone, of Sioux City, ascertain the true condition of the lands leased by said Stone, and everything connected with his agency, and report to the Board at their next meeting.

Ordered, That, during the ensuing year, instruction in German be discontinued.

Miss Ellen Harlow was elected Librarian and Miss Julia Blodgett, Assistant Librarian.

Ordered, That military drill be voluntary; that all students choosing the course in "Military Tactics and Engineering" be required to uniform themselves; and that the time occupied in drill be considered as instructive labor, performed without compensation.

NOVEMBER 15.

All members present, except Mr. Warden.

The salaries, for the ensuing year, were fixed as follows:

Professor of Military Tactics, Engineering, Steward and Deputy	
Treasurer.....	\$1,800
Professor of Botany and Entomology.....	1,800
Professor of English Literature.....	1,800
Professor of Civil Engineering....	1,800
Professor of Chemistry.....	1,800

Professor of Mechanical Engineering.....	1,600
Professor of Horticulture and Forestry... ..	1,600
Assistant Professor of Physics.....	1,500
Assistant Professor of Mathematics.....	1,500
Assistant Professor of Practical Agriculture and Farm Superin- dent (with board).....	1,500
Matron of College.....	1,000
Instructor in Domestic Economy, English Composition, and Elocution.....	500
Instructor in Chemistry.....	1,000
Matron of Farm House (with board).....	500
Housekeeper of College (with board during College term).....	500

Ordered, That a Professor of Practical Agriculture be appointed, and that his salary be fixed at \$1,800 per annum.

Ordered, That E. W. Stanton be re-elected Secretary of the Board of Trustees; that he be allowed \$300 per annum as compensation, for performing the duties of said office; and that said salary commence November 15, 1875.

Ordered, That Wm. D. Lucas be re-elected Treasurer of the Iowa State Agricultural College; that his salary be fixed at \$500.00 per annum; and that said salary commence November 15, 1875.

Ordered, That the sum of \$100.00 be appropriated from Contingent Fund for the purpose of building a College ice-house.

The Executive Committee submitted the following report:

To the Board of Trustees :

The Executive Committee, to whom was referred the report of the Treasurer, beg leave to report that they have examined the same, in connection with the account kept by the Secretary of the Board with said Treasurer, and your committee finds :

That the cash balance in the hands of the Treasurer at the commencement of the year, was \$924.13; that during the year he was debited with cash received, from all sources, \$104,650.67; that he was credited with cash paid out during the year, \$97,507.62: and that there was, at the close of the year, in his hands, a balance of \$8,067.18.

We have examined the receipts and vouchers of said Treasurer sufficiently to satisfy ourselves that he has debited himself with all cash received; that he has proper vouchers for all moneys which he claims to have paid out during the year; that the amounts before mentioned are the true amounts received and disbursed; and that the sum claimed,

\$8,067.18, is the correct balance in the hands of the Treasurer at the close of the College year.

S. J. KIRKWOOD, *Chairman*.

Ordered, That the following items, or so much thereof as may be needed, be appropriated from the Interest Fund, for the purposes specified :

Salaries.....	\$26,000.00
Department of Botany and Entomology.....	100.00
Department of Military Tactics	100.00
Department of Physics.....	400.00
Department of Horticulture and Forestry.....	600.00
Department of Civil Engineering.....	200.00
Ornamental Grounds.....	500.00
Workshop	600.00
Chemical Laboratory.....	600.00
Museum.....	400.00
Library	400.00
Fires and Lights.....	2,000.00
Contingent Expenses.....	2,000.00
Farm Departments.....	600.00

Ordered, That the Farm Superintendent be instructed to sell all cattle not thoroughbred or high grades ; also, that he dispose of all grade sheep, and such work horses as are deemed unprofitable to keep on the farm, the sale to be public or private, as may be deemed advisable by the proper authorities.

Ordered, That the Spring term of the College for the ensuing year open on the first Wednesday in April, 1875.

Ordered, That the sum of \$3,000 be appropriated from the Interest Fund for the purpose of purchasing stock for the College Farm, the same to be expended under the direction of Trustees Whiting and Tracy.

Ordered, That the passage of loaded wagons on the roads, through the grounds of the Agricultural College, is hereby forbidden.

Professor A. H. Porter tendered to the Board his resignation as Professor of Mathematics and Civil Engineering, said resignation to take effect March 1, 1876.

On motion, the resignation of Prof. Porter was accepted.

Professor E. R. Hutchins tendered to the Board his resignation as

Professor of Chemistry, said resignation to take effect March 1, 1876. Resignation accepted.

Ordered, That the price of board at the college farm house, from and after this date, be fixed at four dollars per week; and for single meals fifty cents.

Ordered, That the Trustees approve of the intention, expressed by the officers of the College, to prepare articles for exhibition at the State Fair without competing for premiums.

Ordered, That President Welch be requested to procure information as to suitable persons to fill the vacant chairs in the Faculty of the College.

Ordered, That the Chairman of the Board be authorized to call a meeting of the Board at his discretion.

Mr. Summers, committee on mileage and per diem, submitted the following report, which was adopted :

To the Board of Trustees:

Your committee beg leave to report that the following members of the Board of Trustees are entitled to mileage and per diem for the amounts set opposite their names.

NAMES.	No. of miles.	Mileage.	No. of days.	Per diem.	TOTAL.
S. J. Kirkwood.....	320	\$ 16.00	8	\$ 40.00	\$ 56.00
L. Summers.....	.....	.....	7	35.00	35.00
A. Tracy.....	440	22.00	9	45.00	67.00
C. E. Whiting.....	372	18.60	7	35.00	53.60

Respectfully submitted,

L. SUMMERS.

Board adjourned *sine die*.

E. W. STANTON, *Secretary*.

REGISTER OF METEOROLOGICAL OBSERVATIONS

TAKEN AT THE STATE AGRICULTURAL COLLEGE, AMES, IOWA.

Latitude 42° North, Longitude 93° 38' West; height above the sea, 1,007 feet.

BY J. K. MACOMBER.

For the three Spring months the mean daily temperature is 44.1 degrees. For the Summer the mean temperature is 70.8 degrees. The highest temperature in the Spring was on May 25th, when the temperature, as indicated by the maximum thermometer was 94.3 degrees. On July 7th the temperature in the afternoon rose to 101 degrees, which is the highest for the year. On March 2nd the mercury sank to five degrees below zero, the coldest day for the Spring months. The lowest temperature during the Summer occurred on July 1st, and was 51 degrees, so that the coldest and warmest days of the Summer were in July. The total quantity of rain for March, April and May is 4.4 inches. During the three Summer months the total rain-fall is 16.7 inches. And for the eight months, beginning with March and ending with October, the rain-fall amounts to 29.23 inches.

According to the Army Meteorological Register, the annual rain-fall at Fort Des Moines is about 26 inches, so that the amount fallen in eight months already exceeds the average. Other observers make the annual rain-fall of Iowa considerably greater than 26 inches. There is little doubt that this number, 26 inches, is much too small, unless it be for the extreme north western part of the State. The last severe frost occurred May 2nd, and the first heavy one this fall occurred on the night of the 12th of October, although a little frost was seen on the morning of the 2nd of the same month.

A more detailed account of the weather for each month can be obtained from the tables which are appended. In the monthly tables the date of the month is found in the first column. In the second column is the mean daily height of the barometer in inches, corrected for temperature and height. The third column gives the mean daily temperature, being the mean of three observations, as recorded from a standard thermometer. In column four is given the highest temperature of each day, as indicated by the maximum thermometer. Column five gives the lowest temperature for each day; column six the amount of rain, or snow melted, in inches, and the seventh column the kind of weather.

APRIL, 1875.

Date.	Barometer corrected for temperature and height.	Thermometer exposed to the open air.	Thermometer, maximum	Thermometer, minimum.	AMOUNT OF RAIN OR SNOW IN INCHES.	KIND OF WEATHER.
1	.....	29.6	.....	24.5	..... 0.4	Snow and sleet.
2	.....	43.	52.	25.	.....	Clear.
3	.....	44.1	55.	36.	.....	Clear.
4	.....	41.3	58.	28.5	.....	Fair.
5	.....	51.	69.	39.	.....	Cloudy.
6	.....	40.5	47.5	36.	..... 0.1	Rain.
7	.....	56.6	75.	42.	..... 0.2	Rain.
8	.....	44.1	64.	37.1	.....	Sprinkle.
9	.....	42.	54.	29.5	.....	Clear.
10	.....	41.1	53.5	31.	.....	Fair.
11	.....	34.8	42.5	31.	.....	Cloudy.
12	.....	34.6	43.	32.	.....	Snow and rain.
13	.....	41.6	54.	31.	..... 0.3	Drizzling.
14	.....	47.	61.	36.	.....	Clear.
15	29.96	33.8	41.	27.	.....	Fair.
16	30.20	19.3	30.	15.	.....	Clear.
17	30.10	31.	46.	30.	.....	Clear.
18	30.09	51.3	74.	26.	.....	Clear.
19	29.76	62.	81.	41.	.....	Clear.
20	30.12	41.8	62.	32.	.....	Clear.
21	30.29	41.6	59.	26.	.....	Clear.
22	30.31	45.	72.	26.	.....	Clear.
23	30.28	52.6	62.	34.5	.....	Clear.
24	30.23	41.3	64.	28.	.....	Fair.
25	30.23	47.6	67.	29.	.....	Clear.
26	30.14	49.1	58.	41.	.....	Fair.
27	29.91	53.6	70.	27.5	Shower.....	Cloudy.
28	29.77	52.1	61.	41.	Rain..... 0.8	Rainy.
29	29.81	44.6	57.5	39.	.....	Cloudy.
30	29.88	40.8	49.	34.	.....	Cloudy.
ean.	30.07	43.3	Max.75.	Min. 15.	Rain and snow 1.8 in.	.....

MAY 1875.

Date.	Barometer corrected for temperature and height	Thermometer exposed to the open air.	Thermometer, maximum.	Thermometer, minimum.	AMOUNT OF RAIN OR SNOW IN INCHES.	KIND OF WEATHER.
1	29.78	34.5	43.5	32.	Shower..... 0.2	Fair.
2	29.94	42.1	55.	25.	.....	Fair.
3	29.86	40.5	49.5	36.	..... 0.4	Cloudy.
4	29.82	49.3	63.5	33.5	.....	Clear.
5	29.75	54.	68	45.	.....	Fair.
6	29.67	53.5	70.5	39.5	.....	Cloudy.
7	29.11	73.	90.	38.5	.....	Fair.
8	29.57	56.5	83.5	47.	.....	Cloudy.
9	29.66	54.5	66.5	45.	.....	Fair.
10	29.79	54.6	67.	42.	.....	Fair.
11	29.76	51.	64.	45.	.....	Clear.
12	30.03	58.1	67.5	39.	.....	Fair.
13	29.83	64.	75.	49.	.....	Fair.
14	30.11	61.6	78.	42.	.....	Clear.
15	30.46	60.5	72.	47.	.....	Clear.
16	30.41	56.6	74.	33.5	.....	Clear.
17	30.26	60.5	80.	39.	.....	Fair.
18	30.20	65.	77.	43.	.....	Fair.
19	30.09	71.	87.	56.	.....	Cloudy.
20	29.94	69.1	87.5	51.	Rain..... 0.2	Cloudy.
21	29.90	68.3	78.	58.	Rain..... 0.5	Cloudy.
22	29.91	72.1	85.	50.5	.....	Clear.
23	29.84	74.1	.....	53.	.....	Clear.
24	29.91	74.6	92.	55.	.....	Fair.
25	30.00	77.	94.	58.	Shower..... 0.2	Clear.
26	29.95	75.1	88.5	60.	.....	Clear.
27	29.89	68.1	78.5	63.	.....	Cloudy.
28	30.10	56.5	72.	52.	Shower..... 0.1	Fair.
29	30.24	66.6	75.	54.	.....	Clear.
30	29.94	69.6	84.	45.5	.....	Fair.
31	29.71	71.3	85.5	63.	Shower..... 0.2	Cloudy.
Mean.	29.92	61.3	Max. 94.	Min. 25.	Amount..... 1.8	.....

JUNE.

Date.	Barometer corrected for temperature and height.	Thermometer exposed to the open air.	Thermometer, maximum	Thermometer, minimum	AMOUNT OF RAIN OR SNOW IN INCHES.	KIND OF WEATHER.
1	29.65	64.5	.....	.....	.....	Cloudy.
2	29.97	67.	.....	.....	.....	Fair.
3	30.22	67.5	.....	.....	.....	Clear.
4	30.07	70.5	.....	.....	.....	Fair.
5	30.26	61.5	.....	.....	.....	Fair.
6	30.27	61.5	.....	.....	.....	Cloudy.
7	30.14	65.5	.....	.....	.....	Fair.
8	29.99	61.	.....	.....	Rain, night .....1.7	Cloudy.
9	29.90	71.5	.....	.....	.....	Fair.
10	29.85	76.	.....	.....	.....	Fair.
11	30.06	64.5	.....	.....	.....	Fair.
12	30.30	63.	.....	.....	.....	Clear.
13	30.15	58.5	.....	.....	..... 0.2	Rainy.
14	29.87	67.	.....	.....	.....	Cloudy.
15	29.87	78.	.....	.....	.....	Fair.
16	29.93	72.	.....	.....	.....	Fair.
17	29.99	76.5	.....	.....	.....	Fair.
18	30.02	67.	.....	.....	.....	Cloudy.
19	30.33	69.5	.....	.....	Rainy..... 0.3	Cloudy.
20	29.99	67.	.....	.....	.....	Cloudy.
21	29.97	74.	.....	.....	.....	Fair.
22	29.93	77.5	.....	.....	Rain..... 0.2	Cloudy.
23	29.83	77.	.....	.....	.....	Fair.
24	29.91	80.	.....	.....	.....	Fair.
25	29.98	81.	.....	.....	.....	Clear.
26	29.96	79.	.....	.....	Shower..... 0.6	Fair.
27	29.65	64.	.....	.....	.....	Cloudy.
28	30.18	68.5	.....	.....	.....	Clear.
29	30.15	76.	.....	.....	.....	Clear.
30	30.26	69.	.....	.....	.....	Fair.
Mean.	30.02	69.8	.....	.....	Am't rain for mo. 3 in.	.....

JULY, 1875.

Date.	Barometer corrected for temperature and height.	Thermometer exposed to the open air.	Thermometer, maximum	Thermometer, minimum	AMOUNT OF RAIN OR SNOW IN INCHES.	KIND OF WEATHER.
1	30.11	62.	66.5	51.	..... 3.2	Heavy rain.
2	29.96	75.6	97.	63.	.....	.....
3	29.74	68.	100.	63.	..... 0.6	Rainy.
4	30.21	69.	74.	64.	.....	.....
5	30.16	66.	68.	60.5	..... 0.9	Rainy.
6	30.29	73.	87.	55.	.....	.....
7	30.41	79.	101.	54.	.....	.....
8	30.28	78.	88.	56.	.....	.....
9	30.06	76.	96.	63.	..... 0.3	Rainy.
10	30.02	76.	93.	61.	.....	.....
11	30.02	76.	94.	63.	.....	.....
12	29.94	80.	93.5	63.5	.....	.....
13	29.90	79.	88.	65.	.....	.....
14	29.84	79.	94.	62.	.....	.....
15	29.74	81.6	95.	64.	.....	Clear.
16	29.81	85.5	99.	72.	..... 2.5	Rain and hail.
17	29.84	77.	85.	56.	.....	Cloudy with strong wind.
18	30.03	68.	92.	62.	.....	Clear.
19	29.99	72.	98.	56.	.....	Clear.
20	29.96	74.	91.	54.	.....	Clear.
21	29.96	76.	88.	56.	.....	Fair.
22	29.88	73.6	85.	64.	.....	Fair.
23	29.94	77.	95.	61.	.....	Clear.
24	.....	77.	90.	64.	.....	Clear.
25	.....	75.5	86.	63.	.....	Cloudy.
26	.....	75.6	98.	59.	.....	Fair.
27	.....	72.	92.	64.	..... 0.8	Fair, shower.
28	30.00	73.	90.	59.	.....	Cloudy.
29	30.02	71.	94.	61.	.....	Cloudy.
30	30.09	77.	88.	69.	.....	Cloudy.
31	30.21	65.	75.	58.	.....	Cloudy.
Mean.	30 01	74.4	M' x .101°	Min. 51.	8.3 inches.	.....

AUGUST, 1875.

Date.	Barometer corrected for temperature and height.	Thermometer exposed to the open air.	Thermometer, maximum	Thermometer, minimum	AMOUNT OF RAIN OR SNOW IN INCHES.	KIND OF WEATHER.
1	30.24	70.	87.	48.	.....	Clear.
2	30.21	65.7	89.	50.	.....	Clear.
3	30.18	72.3	91.	52.	.....	Clear.
4	30.02	76.2	84.	57.	.....	Clear.
5	29.87	75.8	66.	54.	.....	Clear.
6	30.07	67.7	76.	54.	.....	Clear.
7	30.15	69.2	84.	49.	.....	Clear.
8	30.12	72.2	87.	47.	.....	Clear.
9	29.99	68.	80.	49.5	Sprinkle..... 0.1	Cloudy.
10	29.48	67.2	77.	55.	.....	Fair.
11	29.93	67.7	81.	52.	.....	Clear.
12	29.96	65.8	82.	47.	.....	Clear.
13	30.00	68.3	83.5	45.	.....	Clear.
14	29.88	63.5	82.	48.	.....	Fair.
15	29.93	68.5	78.5	55.	Sprinkle..... 0.1	Fair.
16	30.02	63.	73.5	47.5	Shower..... 0.4	Clear.
17	30.10	64.2	75.5	51.5	.....	Fair.
18	30.08	65.	75.5	51.	Shower..... 0.4	Fair.
19	30.10	63.7	79.	44.5	.....	Clear.
20	30.07	70.	83.	45.	.....	Clear.
21	30.25	67.5	70.	58.	.....	Clear.
22	30.38	59.6	71.5	39.5	.....	Clear.
23	30.25	62.3	71.	39.5	.....	Clear.
24	30.04	65.	70.	58.	Sprinkle..... 0.1	Cloudy.
25	29.98	74.3	85.5	60.5	Shower..... 0.3	Fair.
26	29.97	60.7	85.	60.	.....	Cloudy.
27	29.98	73.3	87.	64.	Rain	Fair.
28	29.99	67.	77.	60.	Rain	Cloudy.
29	30.11	67.7	79.	46.	.....	Clear.
30	29.94	77.3	87.	45.5	.....	Fair.
31	29.93	75.8	88.5	62.5	.....	Fair.
Mean.	30.05	68.4	91.	39.5	Amount.....5.4	.....

SEPTEMBER, 1875.

Date.	Barometer corrected for temperature and height.	Thermometer exposed to the open air.	Thermometer, maximum	Thermometer, minimum.	AMOUNT OF RAIN OR SNOW IN INCHES.	KIND OF WEATHER.
1	30.09	77.8	88.5	64.	.....	Fair.
2	29.96	69.2	79.	65.5	Rain..... 1.5	Cloudy.
3	29.93	73.	74.	60.	.....	Clear.
4	30.01	71.	85.	50.	.....	Clear.
5	30.06	66.6	80.	50.	Shower..... 0.2	Cloudy.
6	30.13	73.6	85.	62.	.....	Fair.
7	30.03	76.6	89.	65.	.....	Clear.
8	29.96	77.	93.	61.5	Shower..... 1.62	Fair.
9	30.04	64.2	78.	58.	Rain..... 2.5	Cloudy.
10	30.46	54.6	64.5	46.5	.....	Clear.
11	30.24	56.3	61.	42.	.....	Fair.
12	30.25	68.3	77.	41.	.....	Clear.
13	30.31	64.	76.	47.	.....	Fair.
14	30.25	69.6	81.5	61.5	Rain..... 0.15	Cloudy.
15	30.13	71.2	78.	62.	.....	Foggy.
16	30.16	56.2	66.	51.	.....	Cloudy.
17	30.31	45.8	57.	36.	.....	Clear.
18	29.96	48.8	61.7	32.5	Sprinkle.....	Cloudy.
19	30.00	45.6	55.	37.	.....	Fair.
20	30.30	44.4	57.	34.5	.....	Clear.
21	30.40	44.5	58.1	32.5	.....	Fair.
22	30.25	49.4	62.5	31.5	.....	Fair.
23	30.19	54.1	67.	41.	.....	Clear.
24	30.20	51.5	62.2	38.	Sprinkle.....	Fair.
25	30.31	51.6	65.	38.8	.....	Clear.
26	30.86	58.2	73.	39.5	.....	Clear.
27	29.92	63.4	84.	41.5	.....	Clear.
28	30.02	61.3	76.5	48.5	.....	Clear.
29	30.02	55.8	65.	47.9	.....	Clear.
30	29.86	53.2	62.	47.	Rain..... 0.16	Cloudy.
Mean.	30.12	60.1	Max. 93.	Min. 31.5	Amount of rain... 6.13	.....

OCTOBER, 1875.

Date.	Barometer corrected for temperature and height.	Thermometer exposed to open air.	Thermometer, maximum	Thermometer, minimum	AMOUNT OF RAIN OR SNOW IN INCHES.	KIND OF WEATHER.
1	30.14	44.9	57.8	36.	.....	Clear.
2	30.05	55.8	70.	29.	.....	Clear.
3	29.89	58.3	72.9	37.	..... .05	Cloudy.
4	30.11	49.2	73.	46.	.....	Fair.
5	30.06	48.8	52.	46.	Sprinkle.....	Drizzling.
6	30.16	45.7	55.2	38.5	.....	Fair.
7	30.17	49.3	61.1	38.6	..... .25	Rainy.
8	30.31	42.0	61.1	31.5	.....	Cloudy.
9	30.06	47.2	60.1	31.2	.....	Fair.
10	30.15	39.5	49.1	33.	Rain and snow.... .24	Cloudy.
11	30.40	34.0	45.5	28.	.....	Clear, frost.
12	30.38	36.3	44.1	19.9	.....	Heavy frost.
13	30.08	50.0	67.	27.4	.....	Clear.
14	29.96	46.6	55.5	40.5	.....	Fair.
15	30.07	38.6	50.	27.	.....	Fair.
16	30.01	50.8	67.	26.5	.....	Clear.
17	30.08	46.0	54.	38.5	.....	Clear.
18	30.43	33.5	55.3	22.	.....	Clear.
19	30.26	49.2	66.	23.7	.....	Fair.
20	30.09	52.3	72.4	25.	.....	Clear.
21	30.03	58.1	78.	35.2	.....	Clear.
22	29.93	61.8	79.	43.8	.....	Haze.
23	29.77	58.8	76.4	45.6	.....	Haze.
24	29.81	54.5	76.4	36.7	.....	Haze.
25	29.77	43.0	45.	37.5	Rain.....	Stormy.
26	29.84	35.6	41.	27.3	Rain ..... .87	Cloudy.
27	29.86	39.6	48.	30.2	.....	Cloudy.
28	29.72	45.8	56.5	30.5	.....	Fair.
29	29.81	34.5	45.	30.	Rain and snow.....	Cloudy.
30	30.27	28.6	34.	23.	Rain and snow... .59	One inch snow.
31	30.18	30.8	43.	17.5	.....	Clear.
Mean.	30.03	45.3	Max. 79°	Min 17°5	Amount..... 2.	.....

SUMMARY.

MONTH.	Mean atmospheric pressure.	Mean temperature.	Highest temperature during the month.	Lowest temperature during the month.	Amount of rain or snow.	KINDS OF WEATHER.		
						Days clear.	Days fair.	Days cloudy.
March.....	.....	27.8	74.	-5.	0.8	8	9	14
April	30.07	43.3	75.	15.	1.8	13	6	11
May.....	29.92	61.3	94.	25.	1.8	10	13	8
June.....	30.02	69.8	93.	52.	3.	5	15	10
July.....	30.01	74.4	101.	51.	8.3	.....	.....	.....
August.....	30.05	68.4	95.	39.5	5.4	18	9	4
September	30.12	60.1	93.	31.5	6.13	13	9	8
October	30.03	45.3	79.	17.5	2.0	14	7	10
Means and totals....	30.03	56.3	76.7	28.3	29.23	81	68	65

CALENDAR FOR 1876.

First term begins.....Wednesday, April 5th.
First term examinations.....July 10th, 11th, 12th, 13th.
First term closesJuly 13th.

Second term begins.....July 18th.
Second term examinations.....November 13th, 14th, 15th.
Address before the Literary Societies.....Monday evening, Nov. 13th.
Address before the Trustees.....Tuesday evening, November 14th.
Commencement.....Wednesday afternoon, November 15th.
Term closes.....November 15th.

INDEX.

	PAGE.
Agriculture.....	66
Agriculture Course.....	56
Appropriations, 1874.....	173
Appropriations, 1875.....	186
Architecture, Course in.....	56
Board of Instruction.....	6
Board of Trustees.....	5
Book Keeping.....	175
Botany.....	71
Bunt.....	128
Care of money, etc.....	34
Catalogue of Students.....	16
Chemistry.....	69
Code.....	36
Civil Engineering.....	75
Civil Engineering Course.....	59
Compensation for labor.....	47
College Societies.....	35
Conditions of Admission.....	33
County Representation.....	14
Counties not represented.....	15
Council.....	39
Courses of Study.....	56
Comparative Anatomy.....	73
Damages to College Property.....	33
Demerits.....	40
Departments of Instruction.....	66
Domestic Economy.....	74
Drawing.....	47
Donations.....	83

	PAGE.
Economic Entomology.....	72
Elocution	79
English Language and Literature.....	77, 137
Experiments, Farm.....	89
Experiments, Horticulture	103
Excuses	38
Expense.....	33
Faculty	6
Farm Accounts.. ..	91
Farm Experiments.....	89
Farm, Report on.....	87
Finkbine's Report.....	41
French.....	78
Fungi.....	128
Geology.....	73
Government	36
Graduates, 1874.....	172
Graduates, 1875.....	181
Grain Smut.....	132
Heating Apparatus.....	40
Horticultural Report.....	92
Horticulture, Experiments in.....	103
Horticulture and Forestry, Course in.....	57
Insects, Depredations of.....	97
Insects, list of.....	97
Injurious Fungi	128
Inspection	38
Instructive labor.....	48
Labor	44
Laboratory	81
Laboratory Practice.....	47
Ladies' Course in Science.....	60
Land Agent's Report.....	143
Library.....	82
Literary Societies.....	37
Manual Labor.....	44

	PAGE
Mathematics.....	74
Meteorology.....	77
Meteorological Register.....	188
McAfee's Report.....	92
Mechanics.....	134
Mechanical Engineering Course.....	58
Mining Engineering Course.....	60
Military Tactics.....	79
More room needed.....	43
Monthly Details.....	47
Monthly Statement.....	34
Museum.....	81
New Laboratory.....	81
New Heating Apparatus needed.....	40
Needed Repairs of College building.....	41
New Course of Study.....	61
Normal Course.....	61
Observance of By-Laws.....	38
Officers of the Board.....	5
Pay for Labor.....	47
Physics.....	76
Physical Cabinet.....	76
Potatoes, experiments on.....	104
Psychology.....	73
Political Economy.....	78
President's Report.....	13
Proceedings of the Board.....	166
Report of the Trustees.....	9
Report of R. S. Finkbine.....	41
Report of the President.....	13
Reports of Industrial Departments.....	87
Report on Mechanics.....	134
Report of Land Agent.....	148
Report of Laurel Summers.....	152
Report of the Treasurer.....	156
Sabbath and Worship.....	33
Secretary's Report.....	164

	PAGE.
Scope and Spirit of the College.....	48
Societies	37
Smut.....	128, 132
Smut, corn.....	133
Stalker's Report.....	87
Stock breeding, course in.....	38
Surveying.....	47
Supervision.....	48
Specimen Examinations.....	35
Summary of Students in attendance.....	32
Synopsis of College Code.....	35
Student Government.....	39
Time Table.....	64
Trees and Shrubs, list of.....	100
Treasurer's Report.....	156
Tuition free.....	33
Workshop.....	136
Wynn's Report.....	137
Zoology.....	72



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